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ABSTRACT

This Illinois State Board of Education teacher's guide on business computations is for students enrolled in the 9th or 10th grade. The course provides a foundation in arithmetic skills and their applications to common business problems for the senior high school vocational business courses. The curriculum guide includes teacher and student activities that can be implemented in many ways. Information on how to integrate the activity objectives of the Illinois Plan for Business, Marketing, and Management into the State Learning Goals also is included. A model for the curriculum is presented that suggests areas and grade levels of study, and a plan for implementing the course is provided. A partially annotated bibliography lists 58 print, 13 audiovisual, 45 computer software, and 19 other resources. The guide contains 17 units: keeping cash and checkbook records; computing total pay; computing regular and overtime pay; computing net pay and commissions; computing costs of fringe benefits and job expenses; selling merchandise at retail and wholesale levels; selling goods at the manufacturing level; financing business through loans; saving and investing; acquiring, maintaining, and operating plant and equipment; computing transportation expenses; computing taxes; computing cost of insurance; understanding business data; understanding types of business organization; solving other business problems; and using metric measurement. Each unit plan contains the following: an overview, outline, objectives, teacher resources, evaluation ideas, and student activities. Student activities include name, use, objectives, facilities or materials needed, description, and teacher and evaluation suggestions. Three appendices are provided: integration of instructional activities to state learning goals; crosswalk of instructional activities to skills and state learning goals; and an integrated organization of instructional activities for the business and technology concepts course. (NLA)

IL89CD10

Business and Technology Concepts — Business Computations

Illinois State Board of Education

Adult Vocational and Technical Education

TEACHER'S GUIDE

ED338807

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BUSINESS AND TECHNOLOGY CONCEPTS/ BUSINESS COMPUTATIONS

Teacher's Guide

prepared for the
Illinois Plan for Business, Marketing
and Management Education, Grades 9-10
directed by Dr. John H. Rich

Illinois State Board of Education
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PREFACE

This curriculum guide is one of five developed as part of the Illinois Plan for Business, Marketing and Management Education for use at the orientation level (typically the 9th and 10th grades).

A teacher's guide and a companion student activities packet are available for:

Business and Technology Concepts
Business and Technology Concepts/Business Communications
Business and Technology Concepts/Business Computations
Keyboarding, Typewriting and Formatting
Computer Concepts and Software Applications

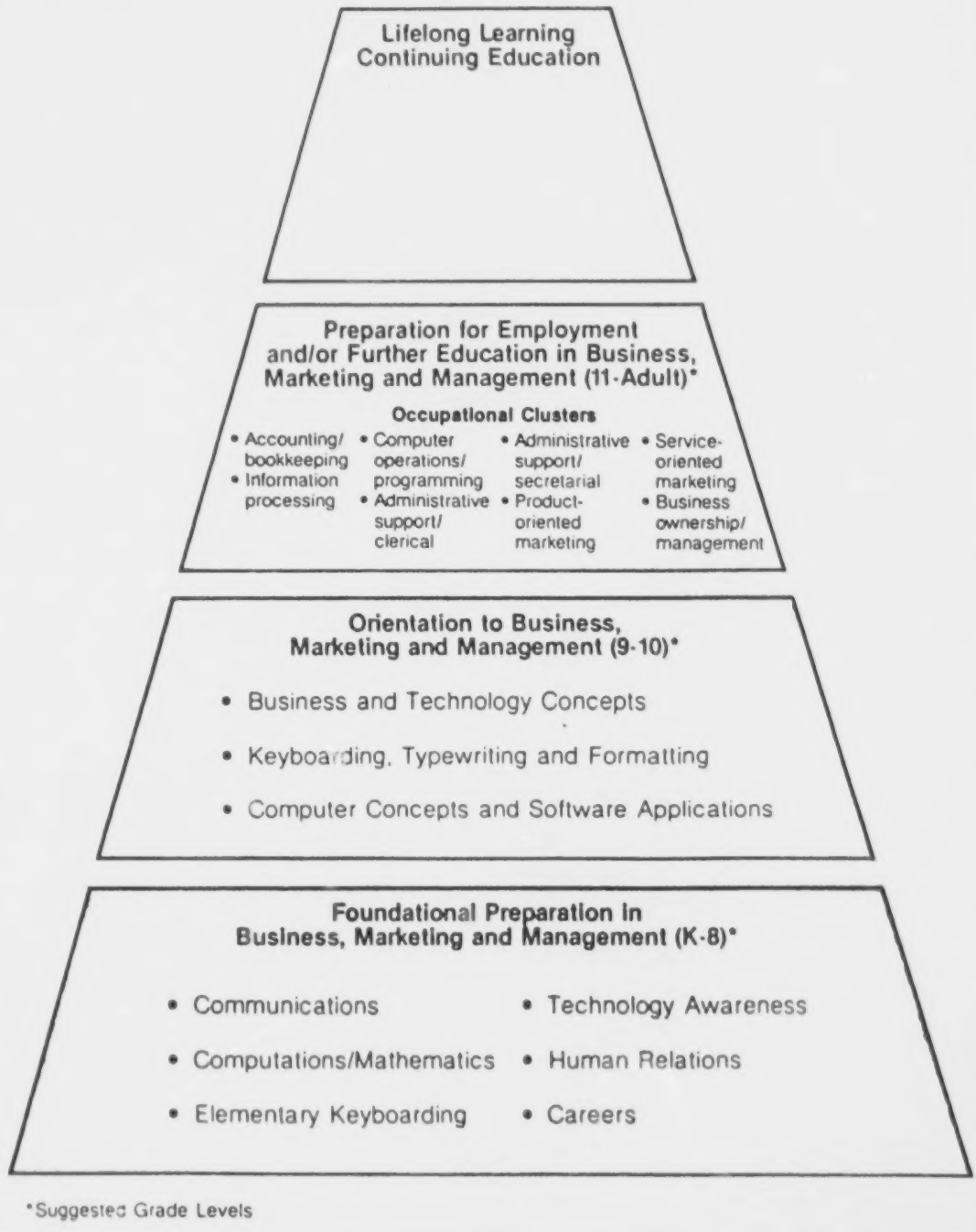
Each curriculum guide includes a wide variety of teacher and student activities which provide extensive flexibility for implementation. Information on how to integrate the activity objectives of the Illinois Plan for Business, Marketing and Management into the State Learning Goals is also included.

The Illinois Model for Business, Marketing and Management Education is presented on the following page. This model presents the suggested areas and grade levels of study.

The Illinois State Board of Education is committed to assisting Education for Employment Regional Systems in the development of quality vocational education programs. The activities outlined in this product have been designed to prepare persons for employment and/or further education in the field of business, marketing and management occupations.

Sincere appreciation is extended to the vocational educators and business and industry representatives who assisted in the development and field-testing of this curriculum.

The Illinois Model for Business, Marketing and Management Education


Lifelong Learning
Continuing Education
Preparation for Employment and/or Further Education in Business, Marketing and Management (11-Adult)*
Occupational Clusters
• Accounting/ bookkeeping
• Information processing
• Computer operations/ programming
• Administrative support/ clerical
• Administrative support/ secretarial
• Product-oriented marketing
• Service-oriented marketing
• Business ownership/ management
Orientation to Business, Marketing and Management (9-10)*
• Business and Technology Concepts
• Keyboarding, Typewriting and Formatting
• Computer Concepts and Software Applications
Foundational Preparation in Business, Marketing and Management (K-8)*
• Communications
• Computations/Mathematics
• Elementary Keyboarding
• Technology Awareness
• Human Relations
• Careers

*Suggested Grade Levels

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BUSINESS AND TECHNOLOGY CONCEPTS/BUSINESS COMPUTATIONS

INTRODUCTION

Course Overview

Business Computations is designed for students enrolled in the ninth or tenth grades. The purpose of the course is to provide a foundation in arithmetic skills and their applications to common business problems for the vocational business courses which follow in the senior high school grade levels.

A one-year course in Business Computations can serve as one of the mathematics credits required for high school graduation. To provide this credit to students, a course outline for the course must be filed with the principal of the high school, and the local school board must give approval.

Course Description

Business Computations is designed to permit students to review the fundamental arithmetic processes and to learn how to apply those processes to common business problems. The course also serves to prepare students for the arithmetic problems they will face in subsequent business courses.

Course Goals

A student who completes this course successfully should be able to perform the following fundamental arithmetic processes correctly.

A. Whole numbers
   1. Read, write and count single- and multiple-digit whole numbers.
   2. Add and subtract single- and multiple-digit whole numbers.
   3. Multiply and divide single- and multiple-digit whole numbers.
   4. Use addition, subtraction, multiplication and division to solve word problems with single- and multiple-digit whole numbers.
   5. Round off single- and multiple-digit whole numbers.

B. Fractions
   1. Read and write common fractions.
   2. Add and subtract common fractions.
   3. Multiply and divide common fractions.
   4. Solve word problems with common fractions.

C. Decimals
   1. Carry out arithmetic computations involving dollars and cents.
   2. Read and write decimals of one or more places.
   3. Round off decimals to one or more places.
   4. Multiply and divide decimals of one or more places.
   5. Add and subtract decimals of one or more places.
   6. Solve word problems with decimals of one or more places.

D. Percents
   1. Read and write percents.
   2. Compute percents.

E. Conversions
   1. Convert fractions to decimals, percents to fractions, fractions to percents, percents to decimals and decimals to percents.
   2. Convert common fractions or mixed numbers to decimal fractions, and decimal fractions to common fractions or mixed numbers.

The student who completes the course successfully should also be able to

1. Solve word problems by selecting the correct processes and using the correct order of operations.
2. Perform written calculations quickly.
3. Compute averages.
4. Use a calculator to perform basic arithmetic operations in the solution to problems.
5. Estimate to determine if a solution to a mathematical problem is reasonable.
6. Apply the fundamental processes correctly for the solution of common business problems.

COURSE RESOURCES
(Partially Annotated)

Textbooks in Business Mathematics or Related Areas

Burton, Sharon and Nelda Shelton. Business Math Using Calculators, South-Western Publishing Company, 5101 Madison Road, Cincinnati, OH 45227, 1985.

Cain, J. and R. Carman. Mathematics for Business Careers, John Wiley and Sons, Inc., 605 Third Avenue, New York, NY 10016, 1985.

Carlo, P. and D. Murphy. Merchandising Mathematics, 3rd ed., Delmar Publishers, Inc., 2 Computer Drive, West, Box 15-015, Albany, NY 12212.

Chernow, F. Business Mathematics Simplified and Self-Taught, Arco Publishing, Inc., Educational Division, 215 Park Ave., South, New York, NY 10003.

Curtis, A. Practical Math for Business, 3rd ed., Houghton Mifflin Co., One Beacon St., Boston, MA 02108.

Developing Basic Math Skills for Marketing, Extension Instruction and Materials Center, P.O. Box 7218, The University of Texas at Austin, Austin, TX 78712.

Dillon, William. Business Mathematics, Delmar Publishers, Inc., 2 Computer Drive, West, Box 15-015, Albany, NY 12212, 1985.

Easterling, C., E. Flottman and M. Jernigan. Merchandising Mathematics for Retailing, John Wiley and Sons, Inc., 605 Third Avenue, New York, NY 10016, 1985.

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Freeman, Herbert and David Graf, Money Management: A Guide to Saving, Spending, and Investing, Glencoe Publishing Company, 809 West Detweiller Drive, Peoria, IL 61615.

Funk, Jerry. Business Mathematics, Bobbs-Merrill Educational Publishing Company, 17337 Ventura Blvd., Encino, CA 91316, 1985.

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Goe, W. Consumer Mathematics, 3rd ed., Harcourt Brace Jovanovich, Inc., 1250 Sixth St., San Diego, CA 92101, 1979.

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Harmeyer, K. Mathematics for Consumers, Media Materials, Inc., Department 840251, 2936 Remington Avenue, Baltimore, MD 21211.

Huffman, Harry, Ruth Twiss and Harold Williams. Math for Business Careers, Gregg Division of McGraw-Hill Book Company, 1221 Avenue of the Americas, New York, NY 10020, 1975.

Johnson, Thomas. Business Math Today, W. C. Brown Company, Dubuque, IA 52001, 1985.

Kaczmarski, Raymond. Financial Cookbook, South-Western Publishing Company, 5101 Madison Road, Cincinnati, OH 45227, 1986. A textbook-workbook for use with the Financial Cookbook software (see Computer Materials below).

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Logan, William and Herbert Freeman. Mathematics in Marketing, Gregg Division of McGraw-Hill Book Company, 1221 Avenue of the Americas, New York, NY 10020, 1978.

Making Basic Math Skills Work for You in Marketing, Extension Instruction and Materials Center, P.O. Box 7218, The University of Texas at Austin, Austin, TX 78712.

Martinka, Marie and James Southam. Vocational Mathematics for Business, South-Western Publishing Company, 5101 Madison Road, Cincinnati, OH 45227.

Mathematics. Instructional Materials Laboratory, 10 Industrial Education Building, University of Missouri, Columbia, MO 65211.

Meyer, R. J. Consumer and Business Mathematics, Arco Publishing, Inc., Educational Division, 215 Park Ave., South, New York, NY 10003.

Muncaster, Barbara and Susan Prescott. Learning Basic Math and Business Math Using the Calculator, South-Western Publishing Company, 5101 Madison Road, Cincinnati, OH 45227, 1985.

Olson, Milton and Barry Haber. Business Mathematics, Glencoe Publishing Company, 809 West Detweiller Drive, Peoria, IL 61615.

Robbins, Paul and Sharon Hauge. Math in the Marketplace, J. Weston Walch, Publisher, Box 658, Portland, ME 04104, 1985.

Rosenberg, Robert, Harry Lewis and Roy Poe, Business Mathematics, Gregg Division of McGraw-Hill Book Company, 1221 Avenue of the Americas, New York, NY 10020, 1982.

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Ryan, Joan. Managing Your Personal Finances, South-Western Publishing Company, 5101 Madison Road, Cincinnati, OH 45227, 1985.

Seltzer. Using Electronic Calculators, 2nd ed., The H. M. Rowe Company, 624 North Gilmor Street, Baltimore, MD 21217.

Stull, William. Marketing Math, South-Western Publishing Company, 5101 Madison Road, Cincinnati, OH 45227, 1985.

Thompson, Linda and Ross Lowe. Consumer Mathematics, Glencoe Publishing Company, 17337 Ventura Boulevard, Encino, CA 91316, 1986.

Wood, Merle, Tom Hendricks and Susan Muller. Basic Mathematics: Skills and Applications, Gregg Division of McGraw-Hill Book Company, 1221 Avenue of the Americas, New York, NY 10020, 1983.

Simulations and Practice Sets

See Audio-Visual Materials and Computer Materials sections for more simulations.

Gerver, Robert and Richard Sgroi. Sound Foundations: A Practical Mathematics Simulation, South-Western Publishing Company, 5101 Madison Road, Cincinnati, OH 45227, 1987. A simulated experience which allows students to create and manage a musical band. The simulation covers most general mathematics topics.

Nanassy, Louis. Standard Payroll Project, 8th ed. Glencoe Publishing Company, 809 West Detweiller Drive, Peoria, IL 61615. A practice set in which students keep payroll records for 18 employees.

Roman, John and Robert Finch. Family Financial Management, South-Western Publishing Company, 5101 Madison Road, Cincinnati, OH 45227, 1983.

Sargent, Patsy and Mary Ward. Security First Bank--A Banking Customer Simulation, South-Western Publishing Company, 5101 Madison Road, Cincinnati, OH 45227, 1986. This simulations contains two reconciliation problems and check writing activities.

Textbooks and Materials for Secondary Students on the Fundamental Processes

See Audio-Visual Materials and Computer Materials sections for more materials on the fundamental processes.

Arithmetic the Easy Way. Chaselle, Inc., 9645 Gerwig Lane, Columbia, MD 21046.

Back to Basics from Addition to Division. Chaselle, Inc., 9645 Gerwig Lane, Columbia, MD 21046.

Barker, V. and R. Aufmann. Essential Mathematics with Applications, Houghton Mifflin Co., One Beacon St., Boston, MA 02108, 1983.

Basic Mathematics Curriculum. Love Publishing Company, 1777 South Bellair Street, Denver, CO 80222. A series of worksheet packets and tests in spirit master form for the review of the four operations and fractions.

Curriculum Committee of St. Paul Technical-Vocational Institute. Mathematics for Careers Series, Delmar Publishing, Inc., 2 Computer Drive, West, Box 15-015, Albany, NY 12212. Eight textbook-workbooks on the four operations, decimals, fractions, mixed numbers, percents, measurement, geometry and consumer applications.

Educational Development Center. Dreadful Demons of the Deep, Ice Cream, Bicycles, Sunburst Communications, 39 Washington Avenue, Pleasantville, NY 10570. Three books correlated with the SemCalc software (see Computer Materials section) help students solve word problems. Despite their titles, they are designed for grades 5-9.

Gafney, Leo and John Beers. Essential Math Skills, Gregg Division of McGraw-Hill Book Company, 1221 Avenue of the Americas, New York, NY 10020, 1981.

Gossage, Loyce. Mathematics Skill Builder, South-Western Publishing Company, 5101 Madison Road, Cincinnati, OH 45227, 1985. A textbook-workbook which provides instruction in the fundamental processes and in some applications in business and consumer mathematics.

Herr, N. Decimals and Percents--A Math Practice Booklet, New Jersey Vocational-Technical Curriculum Laboratory, Rutgers--The State University, Building 4103 Kilmer Campus, New Brunswick, NJ 08903. A textbook-workbook covering the four operations, decimals and

percents, the relationships among decimals, percents and fractions, and the application of percents to interest and discount problems. The materials are primarily exercises and quizzes.

Herr, N. Fractions and Their Applications--A Math Practice Workbook, New Jersey Vocational-Technical Curriculum Laboratory, Rutgers--The State University, Building 4103 Kilmer Campus, New Brunswick, NJ 08903. The workbook is primarily composed of exercises and quizzes.

Learning Achievement Corporation. Math Skills Applied to Career Highlights MATCH), Gregg Division of McGraw-Hill Book Company, 1221 Avenue of the Americas, New York, NY 10020, 1981. Five textbook-workbooks covering number systems, addition, subtraction, multiplication, division, fractions, decimals, percents, measurement, geometry, ratio, proportion and reading graphs.

Lewis and Smith. Basic Arithmetic, Prentice-Hall, Inc., Englewood Cliffs, NJ 07632, 1983.

Maher, C. and A. Snyder. Math 1 & 2, Gregg Division of McGraw-Hill Book Company, 1221 Avenue of the Americas, New York, NY 10020, 1981. Math 1 covers the four operations plus decimals, fractions and percents. Math 2 reinforces Math 1 and also includes applications and problem solving.

May, L. HBJ Mathematics, Harcourt Brace Jovanovich, Inc., 1250 Sixth St., San Diego, CA 92101, 1979.

Porter, H. Programmed Arithmetic Lab, Mafex Associates, Inc., 90 Cherry St., Box 519, Johnstown, PA 15907. A program for testing and teaching the four operations, including student record book, survey test, exercise cards, practice cards, pretests, final tests and teacher's guide.

Shea, J. T. Basic Essentials of Mathematics, 2nd ed., Steck-Vaughn Company, P.O. Box 2028, Austin, TX 78763.

Sullivan Associates. Programmed Math, 2nd ed., McGraw-Hill Book Company, 1221 Avenue of the Americas, New York, NY 10020. A series of eight programmed problem books with little reading required and also eight associated word problem books covering the four operations, fractions, decimals and measurements.

Audio-Visual Materials

Additional audio-visual materials are listed under the Teacher Resources for Unit section of some units.

"Basic Math." Prentice-Hall Media, ServCode CR, 150 White Plains Road, Tarrytown, NY 10591. Six filmstrips, six cassettes and a program guide on the four operations, fractions, decimals, percentages, ratio and proportion.

"Basic Math Facts Competency Lab." Chaselle, Inc., 9645 Gerwig Lane, Columbia, MD 21046. Ten cassettes, 30 copies each of 10 lessons, 10 reproducible posttests and a teacher's guide.

"Insurance for the Wage Earner." Bennet and McKnight (Glencoe Publishing Company), 17337 Ventura Blvd., Encino, CA 91316. A filmstrip and cassette program which provides tips on shopping for auto, life, health, liability and income-protection insurance and explains worker's compensation insurance.

Jones, W. "Cassette Learning Package Series," Media Materials, Inc., Department 840251, 2936 Remington Ave., Baltimore, MD 21211. Each cassette comes with 30 student booklets and tests. There are 10 cassettes on "Using Operations with Whole Number," 7 on "Using Fractions," 6 on "Using Operations with Decimals," 4 on "Using Percent Series," and 4 on "Using Measurement Series."

"Money Problems." Dorsett Educational Systems, Inc., P.O. Box 1266, NE Corner of Goldsbert Airport, Norman, OK 73070. Sixteen lessons on cassettes covering word problems, currency, interest, business arithmetic, rates and commission.

O'Neil. "Countdown," Bowmar/Noble Publishers, Inc., P.O. Box 25308, Oklahoma City, OK 73125. A series of 50 cassettes with reusable student folders on number concepts, addition, subtraction, multiplication and division.

Schwartz, S. "Real-Life Math," Career Aids, Inc., 8950 Lurline Avenue, Dept. TE4562, Chatsworth, CA 91311. A multimedia kit for slower students who participate in business transactions and money management through role-playing activities. Covers choosing a job, completing a bill, using checking and savings accounts, and organizing records. There are 10 cassettes, 5 student skill books, spirit masters and other materials.

"Tech Math." Prime Distribution, Inc., 87 Indian Rock Road, Windham, NH 03087. A total of 131 separate audio-visual programs designed to teach lower-level mathematics skills to high school students.

Teschner, G., et.al. "Mathematics Skills Films and Tests," The Continental Press, Inc., Elizabethtown, PA 17022. Twenty-four 35mm self-paced filmstrips with pretests and posttests for each film.

"Think Metric." South-Western Publishing Company, 5101 Madison Road, Cincinnati, OH 45227, 1975. A sound filmstrip with textbook-workbook covering basic topics in metric measurement.

Understanding the Metric System. Society for Visual Education, Inc., Department BE, 1345 Diversey Parkway, Chicago, IL 60614. Four full-color filmstrips with associated audio tapes which parody a TV game show. Coverage: area, volume, capacity, temperature and mass.

Watts, Michael. "A Guide to Tax Whys: Understanding Taxes," Publication 1247, Department of the Treasury, Internal Revenue Service, 1984. Six 15-minute video/film programs on issues in taxation. Address queries to ATTN: Understanding Taxes Coordinator, P.O. Box 1193, Chicago, IL 60690 or P.O. Box 396, Springfield, IL 62705.

Wehril, K. "Michigan Arithmetic Program," Ann Arbor Publishers, P.O. Box 7249, Naples, FL 33941. A series of 45-minute video tapes (or teacher scripts) along with pretests and posttests on numbers, numerals, addition, multiplication, subtraction and division.

Computer Materials

"Bank Reconciliation." Micro Learningware, Highway 66 South, P.O. Box 307 Mankato, MN 56001. Allows students to prepare bank reconciliation statements given the current balances, checks written, outstanding checks and charges.

"Baron." Blue Chip Software, Inc., 6744 Eton Avenue, Canoga Park, CA 91303. Students simulate investing in commercial, residential and underdeveloped property.

"Basic Business Finance." Softext Publishing Corporation, 17 East 45th St., Suite 605, New York, NY 10017. A textbook/software package presenting basic ideas in finance, assets, liabilities, equity, financial statements, cash flow and profitability.

"Basic Business Graphics." Softext Publishing Corporation, 17 East 45th St., Suite 605, New York, NY 10017. A textbook/software package incorporating all aspects of the presentation of business graphs and charts.

"Binary Math." Opportunities for Learning, Inc., 20417 Nordhoff St., Dept. 7C, Chatsworth, CA 91311. A software program which teaches the binary arithmetic used by computer systems.

"Bottomline--V--A Financial Decision Support System." ILAR Systems, Inc., 1300 Dove Street, Suite 200, Newport Beach, CA 92660. Presents sales forecasting, budgeting, cash flow, break-even analysis and financial statement analysis.

"Business Education Package 1." Micro Learningware, Highway 66 South, P.O. Box 307 Mankato, MN 56001. Contains four programs: loan amortization, bank reconciliation, stock market simulation and depreciation.

"Business Education Utilities." Minnesota Educational Computing Corporation (MECC), 3490 Lexington Avenue, North St. Paul, MN 55112. A collection of programs such as interest earned on savings, setting up a payroll system, and competition in the marketplace.

"Complex Operations Tutorcourse." Opportunities for Learning, Inc., 20417 Nordhoff St., Dept. 7C, Chatsworth, CA 91311. Nine disks covering averaging, rounding, estimating, prime numbers and factors, composite numbers and factors, common factors and common multiples, exponents and bases, squares and square roots, order of operations and practical applications.

"Computer Stocks and Bonds." Microcomputer Games, A Division of the Avalon Hill Game Company, 4517 Hartford Road, Baltimore, MD 21214. Students simulate investing in securities.

"Decimal Dungeon." Opportunities for Learning, Inc., 20417 Nordhoff St., Dept. 7C, Chatsworth, CA 91311. A single disk provides skill development in decimals. Designed for middle school and junior high students.

"Decimals Tutorcourse." Opportunities for Learning, Inc., 20417 Nordhoff St., Dept. 7C, Chatsworth, CA 91311. Thirteen disks covering all facets of decimals.

Dugdale, Sharon and David Kibbey. "Interpreting Graphs," Sunburst Communications, 39 Washington Avenue, Pleasantville, NY 10570. Two programs on one disk which help students understand and interpret graphs.

Educational Development Center. "Dreadful Demons of the Deep, Ice Cream, Bicycles," Sunburst Communications, 39 Washington Avenue, Pleasantville, NY 10570. A software package which helps students solve word problems. Correlated with the three books, Dreadful Demons of the Deep, Ice Cream, and Bicycles listed in the fundamental operations section. Designed for grades 5-12.

Educational Development Center and Judah Schwartz. "Get to the Point," Sunburst Communications, 39 Washington Avenue, Pleasantville, NY 10570. Three games on one disk to review decimal concepts and skills. Designed for grades 5-9.

Educational Development Center and Judah Schwartz. "Partial Fractions," Sunburst Communications, 39 Washington Avenue, Pleasantville, NY 10570. Provides five levels of problems to help students learn multiplication and division of fractions. Designed for grades 5-9.

Educational Development Center and Judah Schwartz. "Power Drill," Sunburst Communications, 39 Washington Avenue, Pleasantville, NY 10570. Four programs on one disk review four fundamental operations. Designed for grades 4-9.

"Financial Cookbook." Created by Electronic Arts and published by South-Western Publishing Company, 5101 Madison Road, Cincinnati, OH 45227, 1986. A software package providing 32 programs for computing solutions to business problems, such as depreciation, mortgage interest, savings and credit.

"Fraction Action." Opportunities for Learning, Inc., 20417 Nordhoff St., Dept. 7C, Chatsworth, CA 91311. One disk provides a game for testing and developing skill in fractions.

"Fraction Fuel-Up." Opportunities for Learning, Inc., 20417 Nordhoff St., Dept. 7C, Chatsworth, CA 91311.

"Fractions." Opportunities for Learning, Inc., 20417 Nordhoff St., Dept. 7C, Chatsworth, CA 91311. Twenty-four interactive computer programs cover the study of fractions.

"Fractions and Decimals." Opportunities for Learning, Inc., 20417 Nordhoff St., Dept. 7C, Chatsworth, CA 91311. Two disks cover fundamental operations with fractions and decimals.

"Fractions Tutorcourse." Opportunities for Learning, Inc., 20417 Nordhoff St., Dept. 9F, Chatsworth, CA 91311. A software package which teaches fraction concepts and develops skill in solving fraction problems.

"Get Rich! Insurance Planning." Arrays, Inc./Continental Software, 11223 South Hindry Avenue, Los Angeles, CA 90045. Allows students to play "what if" games for various insurance situations.

"Get Rich! Real Estate Planning." Arrays, Inc./Continental Software, 11223 South Hindry Avenue, Los Angeles, CA 90045. Covers a variety of problem situations for the real estate buyer or investor, including whether to buy or rent and what type of mortgage to select.

"Get Rich! Strategies." Arrays, Inc./Continental Software, 11223 South Hindry Avenue, Los Angeles, CA 90045. Teaches basic money management skills using worksheets, calculations and graphs to prepare financial plans.

Kingman, J. and R. Swenson. "Arithmetic Drill: Addition, Subtraction, and Multiplication," EMC Publishing, Changing Times Educational Service, 300 York Avenue, St. Paul, MN 55101.

Koetke, Walter. "Survival Math," Sunburst Communications, 39 Washington Avenue, Pleasantville, NY 10570. Four computer simulations on one disk which help students apply math skills to everyday life. The four programs are Travel Agent Contest, Shopper Marathon, Hot Dog Stand and Foreman's Assistant.

Learning Achievement Corporation. "MATCH Microcomputer Software Program," Gregg Division of McGraw-Hill Book Company, 1221 Avenue of the Americas, New York, NY 10020, 1981. A software companion to the hardcopy materials listed under Textbooks and Materials for Secondary Students on the Fundamental Processes.

"Math for the Young Consumer." Orange Cherry Media, 52 Griffin Avenue, P.O. Box 427, Bedford Hills, NY 10507. Presents fundamental skills applied to everyday consumer problems, such as earning and saving money, shopping, buying at sales and managing money.

"Math Man." Opportunities for Learning, Inc., 20417 Nordhoff St., Dept. 7C, Chatsworth, CA 91311. One disk provides a PAC-MAN-like game to review and reinforce student skills in the four processes.

"The Math System." Opportunities for Learning, 20417 Nordhoff St., Dept. 9F, Chatsworth, CA 91311. A comprehensive and interactive software package providing testing, diagnostics and instruction in addition, subtraction, multiplication, division, fractions, decimals, ratios, percents and negatives. Five instructional disks, a diagnostic testing disk, a class records disk, and a data storage disk are provided.

"Mathematical Concepts." Opportunities for Learning, Inc., 20417 Nordhoff St., Dept. 7C, Chatsworth, CA 91311. Five disks: "Division Skills," "Mixed Numbers," "Decimal Skills," "Percents" and "Ratios and Proportions."

"Mathematics Activities Courseware." Houghton Mifflin, One Beacon St., Boston, MA 02108. Fifteen groups of lessons and activities designed for each level (grades 1-8).

"Mathematics Courseware." Silver Burdett, 250 James St., Morristown, NJ 07960. Four software disks: one for addition and subtraction, one for multiplication and division, and two for fractions.

"Mathematics Problem Solving Software." Addison-Wesley Publishing Company, Reading, MA 01867. A software package designed for each grade level. The business teacher might select the package for the eighth grade from packages designed for grades 1-8 for reviewing basic arithmetic. The package emphasizes the solution to word problems.

"Mathematics Unlimited Problem Solving." Holt, Rinehart, and Winston, 383 Madison Avenue, New York, NY 10017. Basic arithmetic designed for the eighth grade level (lower grade levels can be purchased, also).

"Mathematics Word Problems." Opportunities for Learning, Inc., 20417 Nordhoff St., Dept. 7C, Chatsworth, CA 91311. Four disk programs provide instruction in the four processes, decimals, percents and other applications. "Word Problems 7" covers addition, subtraction, multiplication and division. "Word Problems 8" covers area, perimeter, fractions, measurements and percent. "Decimal Word Problems" covers key terms and concepts in decimal problems. "Percent Word Problems" covers concepts pertaining to percentage.

"Millionaire." Blue Chip Software, Inc., 6744 Eton Avenue, Canoga Park, CA 91303. Combines simulated stockmarket transactions with numerous economic, political and market conditions to teach the risk and rewards in stockmarket investing.

"Milt's Math Drills." Hartley Courseware, Inc., 133 Bridge St., Dimondale, MI 48821. While designed for K-4, 6 program disks and a teacher's guide are useful for diagnosing student problems in the fundamental processes and providing remedial drill.

"Percentages Tutorcourse." Opportunities for Learning, Inc., 20417 Nordhoff St., Dept. 9F, Chatsworth, CA 91311. A software package which teaches about percentages, proportion and ratio.

"Squire." Blue Chip Software, Inc., 6744 Eton Avenue, Canoga Park, CA 91303. Allows student to experiment with a full range of investment options and develop a financial game plan.

"The Tax Advantage: Educational Version." South-Western Publishing Company, 5101 Madison Road, Cincinnati, OH 45227. Assists students in completing Form 1040.

Waterford School District and Peter Wierzbicki. "The Whatsit Corporation," Sunburst Communications, 39 Washington Avenue, Pleasantville, NY 10570. One disk provides a one-product business simulation for students.

Other Resources

American Bankers Association, 1120 Connecticut Avenue, N.W., Washington, D.C. 20551.

Better Business Bureau of New York, Inc., Educational Division, 220 Church St., New York, NY 10013.

"Business Mathematics." University of the State of New York, The State Education Department, Bureau of Business, Marketing and Distributive Education, Albany, NY 12234. A detailed course outline.

Consumer and Community Services Institute of Life Insurance, 277 Park Avenue, New York, NY 10017.

Consumer Reports. Consumers Union of U.S., Inc., 256 Washington St., Mount Vernon, NY 10553. A monthly magazine featuring many articles relating to business mathematics. Subscription Department address is Box 53009, Boulder, CO 80321.

"Educational Software Directory for IBM Personal Computers." Electronic Communications, Inc., Suite 220, 1311 Executive Center Drive, Tallahassee, FL 32301. An annotated listing of computer software in business education, vocational education and other educational areas.

Greenan, J. and J. Powell. "Generalizable Mathematics Skills: Resource Directory," Department of Adult, Vocational and Technical Education, Illinois State Board of Education, June 1984. This is a gold mine of resources in the areas of fundamental skill development and general mathematics topics.

Greenan, J. "Generalizable Mathematics Skills Assessment: User Manual," Department of Adult, Vocational and Technical Education, Illinois State Board of Education, June 1984.

Greenan, J. "Identification of Generalizable Skills in Secondary Vocational Programs," Department of Adult, Vocational and Technical Education, Illinois State Board of Education, June 1983.

"Insurance Insights." Insurance Information Institute, 110 William Street, New York, NY 10038. A newsletter for educators providing information about property and casualty insurance premiums and policies.

Long, Thomas. Basic Mathematics Skills and Vocational Education, The National Center for Research in Vocational Education, 1960 Kenny Road, Columbus, OH 43210, 1980.

Money Management Institute of Household International, 2700 Sanders Road, Prospect Heights, IL 60070.

"Occupational Outlook Handbook." U.S. Department of Labor, Bulletin 1700, U.S. Printing Office, Washington, DC 20402.

"Practical Business." Instructional Materials Laboratory, 10 Industrial Education Building, University of Missouri, Columbia, MO 65211. A competency-based, one-semester curriculum covering comparative shopping, consumer complaints and laws, credit, transportation, housing, insurance, taxes, savings and investment and employment benefits.

"Public Domain Software." Pandora Software, P.O. Box 590, Clearfield, UT 84015. A directory of over 4,000 public domain software programs including programs in business and mathematics.

Publications Services, Board of Governors of the Federal Reserve System, Washington, D.C., 20551.

Selected U.S. Government Publications. Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. A catalog of government brochures and books on a variety of topics related to business mathematics.

U.S. Department of Health and Human Services, Social Security Administration, Baltimore, MD 21235.

"Vocational Related Math." Instructional Materials Laboratory, 10 Industrial Education Building, University of Missouri, Columbia, MO 65211. A guide containing units of instruction in measurement, whole numbers, fractions, percent, consumer education and geometry.

INSTRUCTIONAL PLAN

Course Outline

The course outline is designed for a one-year course in business arithmetic or business mathematics. Schools wishing to offer a one-semester course should choose Units A, B, C and D and then select from the other units those which will be most appropriate for their students. Units A, B, C and D provide a review of fundamental processes through the study of cash, checkbook records, wages, salaries, net pay and commissions. A suggested outline for a one-semester course is provided in the Suggested Time Schedule section.

This course may be offered by presenting students a review of the fundamental processes and then instructing them how to apply these processes to common business problems. However, a review of the fundamental processes integrated within the presentation of common business problems is usually more effective. The course outline which follows integrates the review of fundamental processes into the first four units of instruction in a systematic manner, progressing from simple to complex.

The course outline also integrates instruction in use of a calculator within the course outline as opposed to providing a separate unit on calculators. Teachers who do not wish to use calculators in their course plan will find it easy to omit the calculator topics in the outline.

BUSINESS COMPUTATIONS

A. Keeping Cash and Checkbook Records
   1. Keeping cash receipts records
   2. Reviewing addition of whole numbers and decimals
   3. Keeping cash payment records
   4. Reviewing subtraction of whole numbers and decimals
   5. Keeping check records
   6. Completing bank reconciliations
   7. Using a calculator to perform addition and subtraction of whole numbers and decimals
   8. Estimating the solutions to addition and subtraction problems

B. Computing Total Pay
   1. Computing total pay for hourly, piece-rate and salaried workers
   2. Reviewing multiplication of whole numbers and decimals
   3. Reviewing division of whole numbers and decimals

C. Computing Regular and Overtime Pay
   1. Computing regular pay
   2. Reviewing fractions
   3. Computing overtime pay
   4. Reviewing mixed numbers
   5. Reviewing fractional relationships

D. Computing Net Pay and Commissions
   1. Computing deductions and net pay
   2. Computing commissions
   3. Reviewing percents
   4. Reviewing percent relationships

E. Computing Costs of Fringe Benefits and Job Expenses
   1. Computing fringe benefits
   2. Computing job expenses
   3. Comparing jobs

F. Selling Merchandise at Retail and Wholesale Levels
   1. Making change
   2. Completing sales slips
   3. Computing trade discounts
   4. Computing cash discounts
   5. Computing profit on sales
   6. Pricing goods

G. Selling Goods at the Manufacturing Level
   1. Computing factory cost
   2. Computing depreciation on factory plant and equipment
   3. Pricing manufactured goods
   4. Computing break-even point

H. Financing Business Through Loans
   1. Computing interest on promissory notes
   2. Computing exact and banker's interest
   3. Discounting notes
   4. Computing collateral loans
   5. Computing installment loans
   6. Computing cost of borrowing through credit cards

I. Saving and Investing
   1. Computing interest on passbook savings accounts
   2. Computing interest on certificates of deposit
   3. Computing interest on bonds
   4. Computing income from stocks
   5. Computing income from real estate

J. Acquiring, Maintaining and Operating Plant and Equipment
   1. Computing total cost of purchase
   2. Computing depreciation

3. Computing operating expenses of equipment
4. Computing cost of computing
5. Computing costs of utilities

K. Computing Transportation Expenses
1. Computing shipping costs
2. Computing operating costs of transportation equipment
3. Computing travel expenses of employees

L. Computing Taxes
1. Computing property taxes
2. Computing sales and excise taxes
3. Computing social security taxes and benefits
4. Computing unemployment taxes and benefits
5. Computing income taxes

M. Computing Cost of Insurance
1. Computing cost of insuring property
2. Computing cost of insuring cars, trucks and equipment
3. Computing cost of insuring against accidents
4. Computing employee health insurance costs
5. Computing employee life insurance costs

N. Understanding Business Data
1. Reading, interpreting and completing a balance sheet
2. Reading, interpreting and completing an income statement
3. Reading, interpreting and completing business graphs

O. Understanding Types of Business Organization
1. Distributing profit and loss in a partnership
2. Distributing profit and loss in a corporation
3. Distributing profit and loss in a cooperative

P. Solving Other Business Problems
1. Measuring worker productivity
2. Computing office costs
3. Computing proceeds in bankruptcy

Q. Using Metric Measurement
(This optional unit is included to provide separate instruction in the metric system. If metric topics are chosen, the instructor may offer them after Unit D so that the fundamental processes have been reviewed first.)
1. Measuring length metrically
2. Measuring area metrically
3. Measuring capacity metrically
4. Measuring weight metrically

Suggested Time Schedule

The time schedule suggested below is for an "average" group of students attending 180, 45-minute class sessions. The teacher may wish to vary the schedule to fit the needs and abilities of students enrolled, length of class period and number of class sessions available for study. The number of days shown for each unit includes time for quizzes and unit tests.

One-Year Course

Unit		Suggested Time in Days
A.	Keeping Cash and Checkbook Records	11
B.	Computing Total Pay	8
C.	Computing Regular and Overtime Pay	10
D.	Computing Net Pay and Commissions	10
E.	Computing Costs of Fringe Benefits and Job Expenses	8
F.	Selling Merchandise at Retail and Wholesale Levels	24
G.	Selling Goods at the Manufacturing Level	7
H.	Financing Business Through Loans	16
	Semester examination	1
I.	Saving and Investing	21
J.	Acquiring, Maintaining and Operating Plant and Equipment	11
K.	Computing Transportation Expenses	5
L.	Computing Taxes	8
M.	Computing Cost of Insurance	7
N.	Understanding Business Data	10
O.	Understanding Types of Business Organization	6
P.	Solving Other Business Problems	6
Q.	Using Metric Measurement (optional)	10
	Final examination	1
Total days		180

Some schools may not be able to devote a full year to the study of Business Computations. For schools providing a semester of instruction, the following time schedule is suggested. Units A through D should not be considered optional for a one-semester course since these units review the fundamental operations. The rest of the course, however, may be comprised of units selected from the one-year course depending on the needs and interests of the students or the requirements of the local program.

One-Semester Course

Unit	Suggested Time in Days
A. Keeping Cash and Checkbook Records	11
B. Computing Total Pay	8
C. Computing Regular and Overtime Pay	10
D. Computing Net Pay and Commissions	10
E. Computing Costs of Fringe Benefits and Job Expenses	8
- Selected units from the one-year course	42
Final examination	1
Total days	90

Suggested Testing Schedule

1. Once each week rapid calculation drill tests covering addition, subtraction, multiplication, division, fractions, percentages and decimals should be given to students. This testing schedule presumes that daily rapid calculation drills on these topics are maintained throughout the course. Skills in the fundamental processes should be reviewed in the beginning of the course, and development and improvement of skills in the fundamental processes should be continuous throughout the course.
2. Quizzes should be given after each major topic, such as bank reconciliation, has been covered.
3. Unit tests should be administered at the end of each unit.
4. Comprehensive tests should be administered at the end of each quarter. These tests should not emphasize the work of the most recent unit but should measure skill and knowledge developed during the entire quarter.
5. Comprehensive semester and final examinations should be given.

Suggested Grading Policies

Grading may be completed using a weighted average of weekly rapid calculation drill tests, topic quizzes, unit tests, semester tests and final examinations. The following weights might be used to produce a grade for one semester:

Rapid calculation test average	25%
Topic quiz average	25%
Unit test averages	25%
Semester test or final examination	25%

The grading scale for the resulting sum of the averages might be: 90% = A; 80% = B; 70% = C; 60% = D; less than 60% = F.

Course Evaluation Ideas

A number of resources are available which teachers may find helpful in designing quizzes and examinations in Business Computations:

1. Publishers' printed tests. Unit tests, pretests, posttests, semester examinations, final examinations and other tests are available for a nominal fee from most publishers of business arithmetic textbooks. These tests can serve as a test bank for the teacher who is teaching Business Computations for the first time.
2. State competency tests. Printed tests developed and administered by states to measure achievement of fundamental processes or to measure achievement generally in Business Computations are available from a number of states, including Florida and New York. Write to the state supervisor of business education in those states for copies of the examinations.
3. Federal Civil Service Examinations. A number of paperback study courses for civil service examinations include business arithmetic problems. Most college or university bookstores will feature these study course books. The books provide numerous sample questions or questions taken from old examinations which can be used by the teacher.
4. Local employment examinations. A number of large firms require that applicants complete employment examinations which include business arithmetic problems. Personnel departments of local firms may provide copies of old examinations.
5. Old editions of texts. Old editions of texts contain a wealth of test questions for the teacher. Old editions should be saved for this purpose.
6. Elementary school texts. Elementary school texts may provide the teacher with numerous samples of pretests for the fundamental operations. Local elementary school principals may provide copies of various texts or pretests that are available.
7. Office machines and calculator textbooks and workbooks. These texts and workbooks often contain a gold mine of problems, especially fundamental skills problems.

Suggested Homework Policies

Many teachers do not wish to have students complete homework assignments until they are sure that students have had ample practice in the work to be completed. These teachers often feel that completing homework before the work is mastered invites practicing the

wrong method, with the result that some learning must be undone on the following day. Many teachers often do not require any work outside of class.

Other teachers devote a portion of each class session to reviewing the homework assignment and then beginning that assignment in class under the teacher's direction.

Some teachers demonstrate in class the correct method of solving a particular problem, provide practice in solving those problems in class, and then provide homework assignments for additional practice outside of class. Thus, additional class time becomes available for instruction. If the latter approach is taken, the teacher may wish to provide students with answers (but not solutions) to key problems and also a sample solution. In this way, students will know when they have completed the problem correctly and have a sample solution to use when they don't.

Suggestions for Handling Individual Differences

Many students who enter the Business Computations class will be deficient in the fundamental processes. While the rapid calculation drill program suggested for the course will be effective in helping these students, additional help at the beginning of the course is often needed. The use of the flash card activity described in Units A, B, C and D for addition, subtraction, multiplication and division facts and for fractions and percentage facts is recommended.

Special Topics

The use of calculators in the business world has become commonplace. Also, calculators are available at very low cost. If teachers assign outside work to students, there will be no way to control the use of calculators in the solution to the problems. It seems only natural, therefore, that the correct use of calculators to solve business problems be included in the instructional program.

To ensure that students develop speed and accuracy in the fundamental processes, however, it is important that rapid calculation drills be used for warmup and testing each class session. It is also important not to allow students to become dependent on calculators for the correct solution to problems. Thus, it is suggested that two days from each five be selected at random as noncalculator days. At the beginning of each of these days, the teacher may announce that all calculations and solutions must be done without the aid of calculators.

The use of calculators will often improve student abilities to grasp the nature of the business problems under study. This is especially true when lengthy calculations must be done to solve the problems, such as in finding compound interest or the property tax

rate for a town. Since calculation accuracy is improved and since there is little drudgery in solving problems when a calculator is used, students can concentrate on how the problem should be solved.

Career Opportunities and Information

Business mathematics is comprised of a set of skills and knowledge which nearly every person will use, regardless of that person's occupation. As a result, the course in Business Computations is not designed to make students employable in any one job or career. Rather, the course is designed to provide the foundation for education for employment in all business jobs.

UNIT A: KEEPING CASH AND CHECKBOOK RECORDS

UNIT PLAN

Overview of Unit

1. The purpose of the first unit is to teach students how to handle cash receipts, keep a cash payment record, keep a checkbook and check register, make bank deposits, open a checking account, and reconcile a bank statement balance to a checking account balance.
2. This unit is fundamental to the course and should not be considered optional.
3. This unit provides students with practical business applications for the use of addition and subtraction. The need to apply addition and subtraction skills to these problems should provide motivation for improving student skills in adding and subtracting.
4. Each class period should contain one or more rapid calculation drills (see Activity A-2) which review and reinforce basic addition and subtraction facts and skills. These drills should be designed and executed in the same manner as warmup and speed drills in keyboarding. That is, each class should begin with a 3- to 5-minute warmup drill on addition and subtraction. Additionally, one or more 3- to 5-minute speed drills on addition and subtraction should be given within the class period. Persistent drill on addition and subtraction under pressure of time will increase students' speed and accuracy in addition and subtraction just as these same techniques increase speed and accuracy in keyboarding.

Topical Outline of Unit

KEEPING CASH AND CHECKBOOK RECORDS

1. Keeping Cash Receipts Records
   a. Conveying why receipts are given
   b. Completing cash receipt forms
   c. Computing total cash receipts

2. Reviewing Addition of Whole Numbers and Decimals
   a. Reviewing addition facts
   b. Arranging numbers around the decimal point
   c. Verifying the addition process
   d. Using addition shortcuts
   e. Adding horizontally

3. Keeping Cash Payment Records
   a. Using journals to record cash payments
   b. Classifying cash payments
   c. Totaling cash payments and determining new cash balance

4. Reviewing Subtraction of Whole Numbers and Decimals
   a. Reviewing subtraction facts
   b. Arranging numbers around the decimal point
   c. Verifying the subtraction process
   d. Using subtraction shortcuts
   e. Subtracting horizontally

5. Keeping Check Records
   a. Opening a checking account
   b. Using a checking account
   c. Making deposits
   d. Completing a check stub
   e. Completing checks
   f. Endorsing checks

6. Completing Bank Reconciliations
   a. Understanding bank statements
   b. Reconciling bank statements with checkbook balances
      (1) handling services charges
      (2) handling outstanding checks
      (3) handling outstanding deposits
      (4) handling interest earned

7. Using a Calculator to Perform Addition and Subtraction of Whole Numbers and Decimals
   a. Learning to use a calculator keyboard
   b. Adding whole numbers and decimals on a calculator
   c. Verifying the addition process on a calculator
   d. Subtracting whole numbers and decimals on a calculator
   e. Verifying the subtraction process on a calculator

H. Estimating the Solutions to Addition and Subtraction Problems
   a. Rounding off whole numbers and decimals
   b. Adding rounded numbers mentally
   c. Comparing estimated results with actual results

Unit Objectives

At the end of this unit, students should be able to

1. Add vertically whole numbers and decimals manually and with a calculator.
2. Add horizontally whole numbers and decimals manually and with a calculator.

3. Prove addition manually and with a calculator.
4. Subtract vertically whole numbers and decimals manually and with a calculator.
5. Subtract horizontally whole numbers and decimals manually and with a calculator.
6. Prove subtraction manually and with a calculator.
7. Complete cash receipt forms.
8. Maintain a columnar record of cash payments.
9. Open and keep a checking account record in a checkbook.
10. Write and endorse checks.
11. Prepare bank reconciliation statements which involve service charges, outstanding checks, outstanding deposits and earned interest.
12. Estimate the results of addition and subtraction problems by rounding off numbers and adding or subtracting.

Teacher Resources for Unit

"Bank Services for You and Personal Money Management." The American Bankers Association, 1120 Connecticut Avenue, N.W., Washington, DC 20036

Doehring, Gene. Cashier Clerk, South-Western Publishing Company, 5101 Madison Road, Cincinnati, OH 45227, 1983. A textbook-workbook presenting the competencies needed to operate a cash register.

McCullough, Robert and Kenneth Everard. Bank Reconciliation Projects, 3rd. ed., Glencoe Publishing Company, 809 West Detweiller Drive, Peoria, IL 61615. A textbook-workbook containing 12 hands-on projects for personal checking accounts, joint accounts, partnership accounts and corporate accounts.

Sargent, Patsy and Mary Ward. Security First Bank--A Banking Customer Simulation, South-Western Publishing Company, 5101 Madison Road, Cincinnati, OH 45227, 1986. A simulation containing two reconciliation problems and check-writing activities.

"The Story of Checks." Federal Reserve Bank of New York, Public Information Department, 33 Liberty St., New York, NY 10045.

"Your Checking Account." American Bankers Association, 1120 Connecticut Avenue, N.W., Washington, D.C. 20551.

Elementary teachers of grades 3-6 may provide useful suggestions to teachers in developing fundamental addition and subtraction skills.

Elementary arithmetic textbooks may provide the teacher with supplementary drill materials.

Many banks provide interesting instructional materials pertaining to the process of bank reconciliation. Teacher should check with local banks.

Office supply companies stock many examples of cash receipt forms, cash payment forms and cash payment columnar journals. These forms may be used to supplement those found in the text or workbook adopted for the course.

Review the Course Resources section, especially under the headings Textbooks and Materials for Secondary Students on the Fundamental Processes, Audio-Visual Materials and Computer Materials. These sections identify many materials useful for this unit.

Evaluation Ideas for Unit

A quiz might be given after instruction in each of these topics is completed: cash receipts and cash payments, checkbook records and bank reconciliation statements. The use of separate timed examinations measuring speed and accuracy on drill materials might be given at the end of the unit. Also suggested is the inclusion of practical business problems drawn from the unit, such as bank reconciliation statements, checkstub records and columnar records of cash receipts and payments. A total grade on the unit might include scores on weekly rapid calculation drills, quizzes and unit examination.

SUGGESTED STUDENT ACTIVITIES

Activity Name: Arithmetic Fact Cards A-1
Unit Objectives 1, 2, 4 and 5

Suggested Use of Activity

This activity should be used in the first few weeks of the course. The purpose of the activity is to identify specific combinations of the fundamental processes with which the student is weak and to provide drill in these weak combinations.

Most pretests for fundamental arithmetic skills do not provide sufficient information to the teacher to determine how to improve the student's abilities. That is, usually such tests will include one or more problems involving addition, subtraction, multiplication or division. However, poor results on the tests may indicate carelessness as well as lack of skill. Furthermore, when a student fails to solve an addition problem correctly (for example, a problem with 7 five-digit numbers), this is not likely to mean that the student does not know how to add. It is more likely to mean that the student does not know certain addition combinations well enough to use them without error. The problem for the teacher is to identify the combinations on which the student is weak, as a pretest is unlikely to provide sufficient addition problems to identify the weak combinations. The suggested "Arithmetic Fact Card" activity is designed not only to identify those combinations quickly but also to provide a means for improving the student's skill in those combinations.

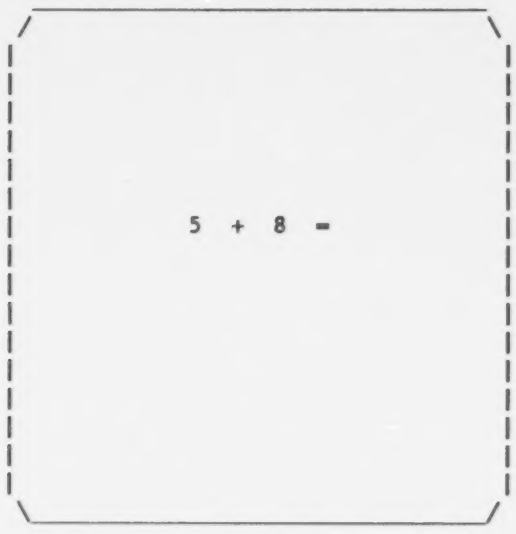
Objectives of Activity

At the end of the activity, students should be able to

1. Identify combinations in addition, subtraction, multiplication and short division in which they are weak.
2. Recite answers to the identified combinations rapidly and without error.

Facilities or Materials Needed

Arithmetic fact cards for addition, subtraction, multiplication and short division. These are cards which have on one side a basic fact problem, such as 9 + 7, and on the other side the solution, such as 9 + 7 = 16. For example:



Cards may be made or purchased from education materials and supply companies. If the decks are made by the teacher, the combinations may be prepared using a word processor and printed out in wide characters on a dot-matrix printer on rectangular peel-off labels. These labels might then be pasted to ordinary 3 x 5 cards. By using the word processor and the peel-off labels, multiple copies are easily made and worn cards or decks can be easily replaced.

Pen/pencil and paper

Description of Activity

Students who demonstrate weakness in the fundamental processes are to be placed in teams of two. The students on each team are to work together to show the problem sides of the cards to each other and to correct the other when errors occur.

Specifically, during the review of addition in Unit A, each team of students is given a deck of addition fact cards. One student holds up a card and the other one provides the answer. The first student then tells the other whether or not the answer is correct. Whenever a student makes an error in the solution or takes a long time to arrive at the answer, the other student places that card in a separate pile. When the entire deck of addition facts has been completed, those cards containing the combinations on which the student erred or delayed would be used for drill. That is, these cards would be held up to the student two or three times in succession to permit the student to develop facility in recognizing the answers to the combinations.

After the first student has had time to run the deck and to drill on the cards that were set aside, the students are to switch roles. This activity might be used (a) at the end of the period if the lesson ends early, (b) during the middle of the class period to provide variation to the lesson or (c) during a regular part of each class period during the first few weeks of the course.

Suggestions for Teacher

Teacher should demonstrate how teams work by showing a small portion of the deck to another student. This demonstration allows students to see the speed with which the cards are shown. Questions can be asked on how the activity should be conducted.

When each fundamental operation is introduced, the appropriate deck of fact cards may be given out to all students or only to those identified as having difficulty with the operation. If only students who are having difficulty with the operation are included, be careful to include only those students who really have problems with the fundamental operation; don't include students who simply are occasionally careless. Avoid singling out students who are weak in a fundamental operation. Include all students in the activity.

Students may be motivated to develop high skill in each fundamental operation by holding "Math Skill Bees" in which students are tested on a particular deck by the teacher in front of the class. Prizes might then be awarded to those with (a) the most right answers and/or (b) the fastest time to complete the deck. A variation of the Math Skill Bee uses teams of students instead of individuals. In this variation, awards are given to the team with the fastest time and/or the fewest errors.

A team should stop using the cards when both team members can solve all the addition combinations on the cards rapidly and correctly.

Suggestions for Evaluation

The success of the activity can be measured by (a) administering a posttest on the fundamental operation covered by the fact-card deck, (b) by having the teacher run the deck with one or more students to test their skill or (c) by observing improved results in the application problems submitted by students for class or homework.

Activity Name: Timed Calculations A-2
Unit Objectives 1, 2, 4 and 5

Suggested Use of Activity

This activity should be used frequently and continuously throughout the course to provide reinforcement of skills in the fundamental operations and to develop increased speed and accuracy in the fundamental operations. The content of the activity should begin with short addition problems appropriate to the first few lessons. Once subtraction has been introduced, timed calculations (TC) should include both addition and subtraction. The process of including additional fundamental processes should parallel their introduction in the course. TC's should include all of the fundamental arithmetic processes: horizontal addition, vertical addition, horizontal subtraction, vertical subtraction, multiplication, division, decimals, fractions, percents and the conversion of numbers to and from fractions, percents and decimals.

This activity should be required of all students in the course in the same manner as timed writings are required in keyboarding courses. TC's may be used at the beginning of the period, during the class period, and at the end of the class period. Since physical skills are not emphasized, warmup drills are not needed.

Timed calculations are a powerful device for increasing the speed and accuracy of fundamental arithmetic skills. If used frequently throughout the course, they will have the same effect on the fundamental arithmetic skills as timed writings have on student keyboarding skills. Their use should not be optional but should be required frequently during each week of instruction.

Objectives of Activity

At the end of any month of this activity, students should be

1. Faster than before in completing problems as measured by the number of completed calculations per minute (CCM).
2. More accurate than before in completing problems as measured by the number of accurately completed calculations per minute (ACCM) and the percentage of accurately completed calculations (PA).

Facilities or Materials Needed

Timer with buzzer or bell
Prepared calculation problems
Pencil

Description of Activity

Approximately 30 two-digit addition, subtraction, multiplication, division, fraction, percent or conversion problems; 15 three-or-more-digit fundamental skill problems; 10 long division problems; or appropriate combinations of each should be used for any one TC. For example, the following problems might be used for a timed calculation during Unit B:

TIMED CALCULATION NO. 25 Name _____

DIRECTIONS: Write the answers to the problems below as rapidly as you can. Be sure to use the correct format for your answers.

1. Add:

234
79
177
586

2. Add:

901 + 253 + 864 + 76 =

3. Subtract:

$12,079.78
- 9,731.89

4. Multiply

108
x 30

5. Divide to the nearest hundredth:

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Students should be given the TC face down on their desks and told to wait until the teacher gives the beginning signal. Then students are to turn over their papers and rapidly write the answers to as many problems as they can complete in one minute. When the timer buzzer rings, the teacher should tell students to put their pencils down. For TC's which are given for practice, students may then exchange papers; and the teacher may display the correct answers on a transparency or on the board or tell students what the answers are. For TC's which are for grading purposes, the papers are to be handed in.

The teacher might grade each TC in the following manner:

1. A correct answer is one in which the correct amount is given. The correct answer must be stated in the correct format, such as containing dollar signs or percent signs or being carried to the correct number of places.
2. The student's CCM is the total number of problems which were completed during the TC. If the TC is for more than one minute, the total number of problems should be divided by the number of minutes.
3. The student's ACCM is the total number of problems which were completed accurately during the TC. If the TC is for more than one minute, the total number of problems completed accurately should be divided by the number of minutes.
4. The student's percent of accuracy (PA) is found by dividing the ACCM by the CCM.

Suggestions for Teacher

1. The teacher may administer TC's by duplicating problems, by writing them on the board behind a map or chart, or by displaying the problems on the overhead projector. The latter procedure is the simplest and easiest for the teacher and allows reuse of the same TC several times over a period of days or weeks without additional effort. It also permits the teacher to administer the TC rapidly whenever needed.
2. The student's TC scores (CCM, ACCM and PA) should be measured against that same student's previous scores. In order to avoid embarrassment, student scores should not be posted on the bulletin board.
3. The teacher may use three-minute TC's instead of one-minute TC's. Three-minute TC's provide a better sample of the student's skills than one-minute TC's because different types of problems can be included.

Suggestions for Evaluation

When TC's are used for grading purposes, the teacher might use the best CCM, ACCM and PA for any given day or week rather than averaging all the student's scores during the period. These best scores can be averaged for grading purposes at the end of the grading period.

Activity Name: Making Change A-3
Unit Objectives 1, 3, 4 and 6

Suggested Use of Activity

This activity is suitable for all students and should be used in the first unit as a practical application of addition and subtraction. While electronic cash registers display the amount of change to be given to customers automatically, not all firms use electronic cash registers. Furthermore, the location of many selling applications make electronic cash registers difficult to use, as in selling products in arenas and stadia. Many teachers will require this activity because of its importance in retailing and other vocational applications of business arithmetic.

Objectives of Activity

At the end of this activity, students should be able to

1. Determine the amount of change to be given the customer after deducting the sale amount.
2. Provide the correct change to the customer in the fewest number of bills and coins possible.

Facilities or Materials Needed

Cash box to help simulate the cash drawer of a register
Currency and coins from novelty stores, games or drawings:

Minimum for Cash Drawer		Minimum for Customer Envelopes	
$0.01	10	$0.01	75
0.05	5	0.05	50
0.10	5	0.10	50
0.25	5	0.25	50
0.50	2	0.50	20
1.00	5	1.00	75
5.00	5	5.00	50
10.00	5	10.00	25
20.00	5	20.00	25

Newspaper advertisements for supermarket food sales, music stores, sporting goods stores and others of interest to students
Legal envelopes for each student

Description of Activity

1. Cut newspaper advertisements so each product advertised is pictured in a separate clipping. Place clipping in an envelope with currency and coins to serve as customer tender for the "purchase" of the product pictured in the advertisement. Give one envelope to each student in the class.
2. Place the cash box or drawer in the front of the room on a desk. Make certain that the currency and coins are arranged in order in the cash drawer. Coins are usually stored in cupped bins in the drawer to facilitate their removal. Currency is usually stored in bins which have paper holders to keep the currency from moving about.
3. Select one student to role-play the clerk and have another student play the role of the customer. The "customer" should open his or her envelope, read the product and price to the class, and submit the enclosed money to the clerk. The clerk then is to make the correct change using the fewest number of bills and coins possible.
4. Provide correct answers if students do not choose the correct change or choose a combination which is not the fewest number of bills and coins possible.
5. Rotate students through the roles of clerk and customer for as long as is needed.

Suggestions for Teacher

1. Teacher demonstrates correct way to handle tendered customer bills and the correct way to call out change being given to the customer. For example, a product selling at $8.98 for which a ten dollar bill was tendered, teacher should demonstrate how the bill is placed on the cash box in full sight of customer as change is made. Teacher should call out change as it is given: "Eight dollars and ninety-eight cents and two cents make nine dollars and one dollar makes ten." Only after the customer has accepted the change should the tendered ten dollar bill be placed in cash drawer.
2. Students become more involved in activity if selling products with which they are acquainted rather than simply making change for abstract purchase amounts. That is, students' motivation is increased when they are asked to make change for the purchase of a cassette recording for $6.98 rather than to make change for a purchase of $6.98.
3. Teacher may spread the activity over several days by distributing only five or ten envelopes on any one day. Spreading the activity over several days maintains student interest and provides for better reinforcement of learning through repeated and distributed practice.

4. A line drawing of buttons used to simulate coins by their color and denomination may be made on a transparency and displayed on the overhead projector during activity. This provides a reference for the clerk, customer and other class students.
5. After completing the activity, ask a cash-register clerk from a local store, a cash-clerk supervisor from a local store, or a cooperative education student who uses a cash register to visit the classroom and explain his/her work. The visitor should point out the correct way to handle the amount tendered and to call out the amounts in change being given. The visitor might also relate ways in which customers have tried to cheat the clerk.
6. Students not directly involved in the activity could fill out sales slips from other ads, put several sales items on one sales slip, total the items, and write in amount tendered and change due.

Suggestions for Evaluation

A paper and pencil test listing products and their prices, the amount tendered, and the correct denominations to give as change might be given after the activity has been completed. For example, a portion of the test question might look like this:

Problem 1

For each product listed below, show how many of each denomination of money should be given in change. The first product is done to show you how.

Product	Price	Amount Tendered	Correct Change								
			0.01	0.05	0.10	0.25	0.50	1.00	5.00	10.00	20.00
Book	$8.98	$10.00	2					1			
Candy Bar	.35	1.00									
Pen	1.79	5.00									

Usually ten to twenty products will provide an appropriate sampling for the test.

Activity Name: Bank Reconciliation Case Study A-4
Unit Objective 11

Suggested Use of Activity

The purpose of this case is to help students develop an appreciation for the importance of reconciling bank statements and checkbooks. This case might be used after the first bank reconciliation problem containing outstanding checks, outstanding deposits and service charges has been completed or after all bank reconciliation problems have been completed. The activity is optional but is appropriate for all levels of students.

Objectives of Activity

At the end of this activity, students should be able to

1. List 2 reasons why bank statement and checkbook balances should be reconciled.
2. Describe 2 consequences which could occur if bank reconciliation statements are not completed.

Facilities or Materials Needed

Bank Reconciliation Case Study handout (may be typed in full caps and reproduced on a transparency)

Description of Activity

Students are to read Bank Reconciliation Case Study and

1. Identify reasons why a bank reconciliation should be completed.
2. Identify consequences to the bank customer if reconciliation is not completed.

Suggestions for Teacher

Choose one student to play the role of Jamie and another to play the role of Anne. Students could enact the scene of the case study to provide interest. As an alternative, the teacher may wish to play the role of Jamie and have another student play the role of Anne.

Students should have completed at least one bank reconciliation statement containing outstanding deposits, outstanding checks and service charges before attempting the case.

The Bank Reconciliation Case Study discussion should cover the following

1. Banks can make errors like any other organization. Possible errors include recording a check twice, recording a check from another customer in Jamie's account, failing to record a deposit, or recording Jamie's deposit in another customer's account.
2. The purpose of a bank reconciliation statement is (a) to identify and correct errors made by the bank or by Jamie in his account and (b) to update the check register balance for service charges, interest earned or other deductions and additions the bank has made to Jamie's account.
3. A failure to record checks and not complete a bank reconciliation statement will result in an incorrect check register balance.
4. An incorrect check register balance may lead to an overdrawn account.
5. Banks charge a fee for each check drawn on an overdrawn account.
6. People to whom Jamie writes checks on an overdrawn account will be forced to contact him for repayment. This could not only prove embarrassing but also may result in penalties and interest charges from firms to whom Jamie owes money.

Suggestions for Evaluation

Two completion test items might be included in the unit test to measure the students' understanding of the reasons why bank reconciliation statements should be completed and the consequences to the bank customer if they are not. The questions might read:

1. List two reasons why bank reconciliation statements should be completed by the bank customer. (Items 2a and 2b in Suggestions for Teacher above may serve as answers.)
2. List two consequences to the bank customer for not completing a bank reconciliation statement. (Items 3 through 6 in Suggestions for Teacher above may serve as answers.)

Name_____

ACTIVITY A-4: BANK RECONCILIATION CASE STUDY

Jamie Brown graduated from high school last month and went to work for the Colbert Manufacturing Company. When he received his first paycheck, Jamie took it to the local bank and opened an account. During the next few weeks, Jamie wrote a number of checks on this account but did not record each one in his check register.

On July 1, Jamie received from his bank a bank statement which listed the deposits the bank knew he had made during June, the checks they knew he had written during June, and the service charge which the bank had deducted from his balance for the month. Jamie also received copies of those deposit slips and the canceled checks which had been recorded in his account.

Anne Todd visited Jamie at his home and noticed the bank statement.

Anne: "Jamie, I see that you got your first statement from the bank. Do you know what you should do with it?"

Jamie: "No, what should I do?"

Anne: "You should prepare a bank reconciliation statement; that's what."

Jamie: "Why do I need to do that?"

Anne: "To find out what your correct balance is and to make sure that neither you nor the bank made any mistakes in keeping your account."

Jamie: "I don't need to do all that. The bank never makes mistakes, anyway. So, I just copied into my check register the bank balance off the statement they sent me. That way I know how much I have in my account."

1. If Jamie copies the bank balance into his check register, will the check register be correct?
2. If your answer to question 1 was "No," what reasons might cause the bank statement balance and the check register balance to be different?
3. Do you agree with Jamie that the bank doesn't make any mistakes?
4. What might happen to Jamie's account because he fails to record his checks as he writes them?
5. What might happen to Jamie's account because he does not complete a bank reconciliation statement?

Activity Name: Endorsement Cases A-5
Unit Objective 10

Suggested Use of Activity

This activity should be completed by all students after they have learned the three types of endorsements: blank, full and restrictive.

The purpose of the activity is to allow students to identify the types of endorsements, write endorsements, know when and where endorsements should be used, and recognize consequences of using wrong endorsement.

Objectives of Activity

At the end of this activity, students should be able to

1. Endorse checks using blank, full and restrictive endorsement types.
2. Identify and name each endorsement type.
3. Choose and endorse a check using the best endorsement type.
4. Identify what might happen to checks if the wrong endorsements are used.

Facilities or Materials Needed

Which Endorsement Should You Use? Problem Numbers 1 through 5 handout
Transparencies of problems
Pen/pencil and paper

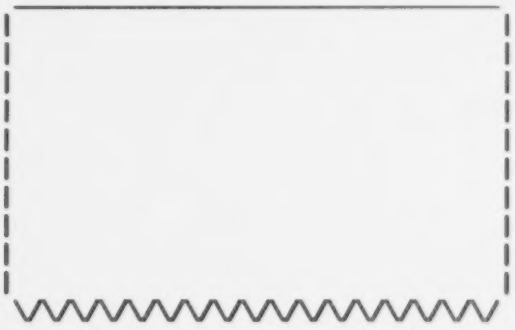
Description of Activity

Show students Problem Numbers 1 through 5. Ask for student answers to each part of each problem to allow students to participate as much as possible. If using transparencies, have each student come to the overhead and write the answer in the space provided. Once an answer has been given, ask another student whether or not the answer given was correct.

Suggestions for Teacher

1. You may wish to develop several sets of problems similar to Problems 1 to 5 so that you may review endorsements from time to time.

2. You might wish to draw the back of a check as shown below on a blank transparency so that you can write endorsements and display them to students using the overhead projector.



Suggestions for Evaluation

Include a situation on the unit test which is similar to Problems 1 to 5. Ask students to identify the type of endorsement to use, complete the endorsement and describe why the endorsement type is appropriate to the situation.

Name_____

ACTIVITY A-5: WHAT ENDORSEMENT SHOULD YOU USE?
Problem Number 1

You are standing in front of the bank teller's window at your bank. You have just completed a deposit slip for the paycheck you wish to deposit in your account.

1. What type of endorsement should you use for this check?

_____

2. Why do you think this endorsement is appropriate?

_____

_____

3. Endorse the back of the check below using that endorsement.

Name_____

ACTIVITY A-5: WHAT ENDORSEMENT SHOULD YOU USE?
Problem Number 2

You have received a refund check from the Internal Revenue Service on last year's taxes. You wish to deposit the check in your account at the bank by mail.

1. What type of endorsement should you use for this check?

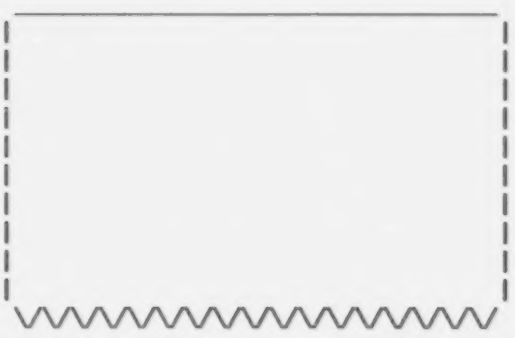
_____

2. Why do you think this endorsement is appropriate?

_____

_____

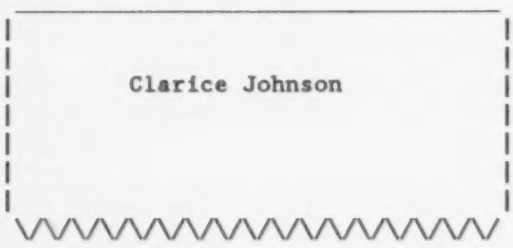
3. Endorse the back of the check below using that endorsement.



Name_____

ACTIVITY A-5: WHAT ENDORSEMENT SHOULD YOU USE?
Problem Number 3

Clarice Johnson received her monthly Social Security check in the mail. She decided to deposit the check in her account at her bank. She completed a deposit slip and endorsed the check as shown below. Later, she lost the check on the way to the bank.



1. What type of endorsement did Clarice Johnson use for this check?

_____

2. What is the worst thing that could happen to Clarice's check?

_____

_____

3. What type of endorsement should Clarice have used to avoid this problem?

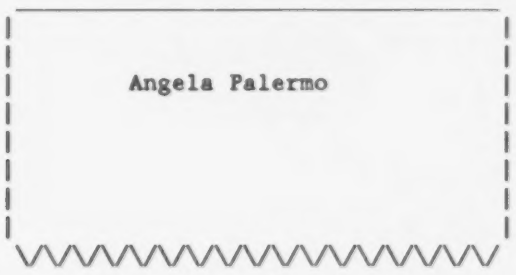
_____

4. Endorse the back of the check below using that endorsement.

Name_____

ACTIVITY A-5: WHAT ENDORSEMENT SHOULD YOU USE?
Problem Number 4

Angela Palermo received a check from her neighbor for raking and mowing the lawn, weeding the flower beds and trimming the shrubs. She wants to deposit that check in her account at the bank using the mail. She completes a deposit slip, endorses the check as shown below and puts the slip and check in an envelope addressed to the bank.



1. What type of endorsement did Angela use for this check?

_____

2. What might happen if this check is lost in the mail?

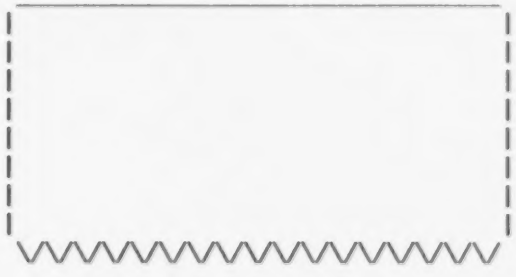
_____

_____

3. What type of endorsement should Angela have used?

_____

4. Endorse the back of the check below using that endorsement.



Name_____

ACTIVITY A-5: WHAT ENDORSEMENT SHOULD YOU USE?
Problem Number 5

You are making a part payment on Loan #876B which you have with the Fester Finance Company (FFC). You wish to pay the bill by mail with a check which you received from Mr. Porter Norris and insure that the payment applies to your loan.

1. What type of endorsement should you use for this check?

_____

2. Why do you think that this endorsement is appropriate?

_____

_____

3. Endorse the back of the check below using that endorsement.

ACTIVITY A-5: WHAT ENDORSEMENT SHOULD YOU USE?
Problem Number 1
(TEACHER'S COPY)

You are standing in front of the bank teller's window at your bank. You have just completed a deposit slip for the paycheck you wish to deposit in your account.

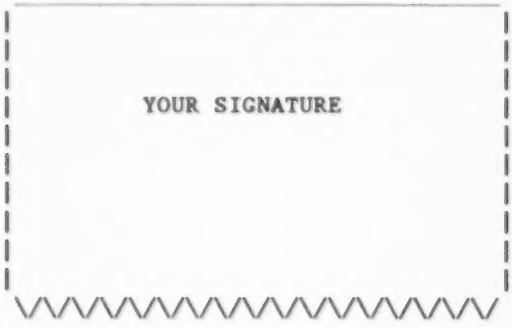
1. What type of endorsement should you use for this check?

   BLANK (OR RESTRICTIVE)

2. Why do you think that this endorsement is appropriate?

   DEPOSITING CHECK AT TELLER'S WINDOW WOULD PRESENT MINIMUM OPPORTUNITY FOR LOSS. RESTRICTIVE ENDORSEMENT WOULD OFFER PROTECTION IN EVENT CHECK IS DROPPED.

3. Endorse the back of the check below using that endorsement.



ACTIVITY A-5: WHAT ENDORSEMENT SHOULD YOU USE?
Problem Number 2
(TEACHER'S COPY)

You have received a refund check from the Internal Revenue Service on last year's taxes. You wish to deposit the check in your account at the bank by mail.

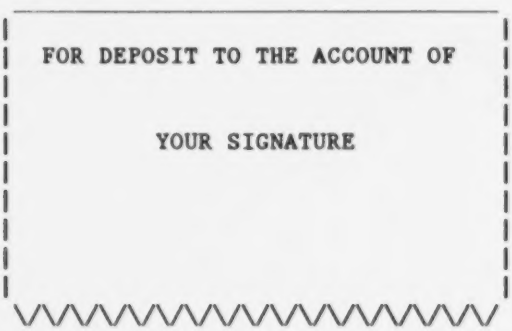
1. What type of endorsement should you use for this check?

   RESTRICTIVE

2. Why do you think this endorsement is appropriate?

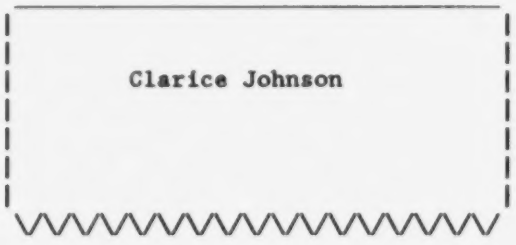
   OFFERS MORE PROTECTION

3. Endorse the back of the check below using that endorsement.



ACTIVITY A-5: WHAT ENDORSEMENT SHOULD YOU USE?
Problem Number 3
(TEACHER'S COPY)

Clarice Johnson received her monthly Social Security check in the mail. She decided to deposit the check in her account at her bank. She completed a deposit slip and endorsed the check as shown below. Later, she lost the check on the way to the bank.



1. What type of endorsement did Clarice Johnson use for this check?

   BLANK

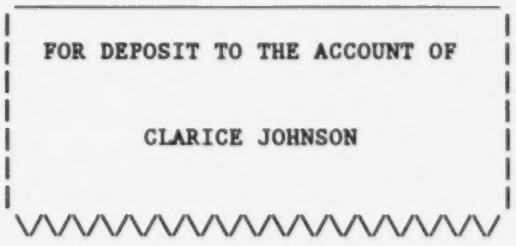
2. What is the worst thing that could happen to Clarice's check?

   SOMEONE ELSE COULD CASH THE CHECK

3. What type of endorsement should Clarice have used to avoid this problem?

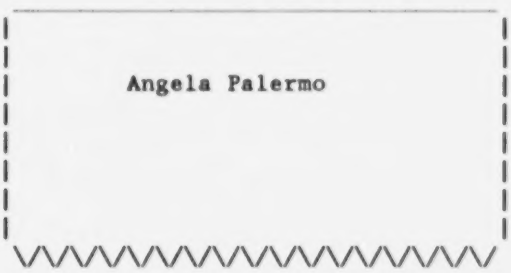
   RESTRICTIVE

4. Endorse the back of the check below using that endorsement.



ACTIVITY A-5: WHAT ENDORSEMENT SHOULD YOU USE?
Problem Number 4
(TEACHER'S COPY)

Angela Palermo received a check from her neighbor for raking and mowing the lawn, weeding the flower beds and trimming the shrubs. She wants to deposit that check in her account at the bank using the mail. She completes a deposit slip, endorses the check as shown below and puts the slip and check in an envelope addressed to the bank.



1. What type of endorsement did Angela use for this check?

   BLANK

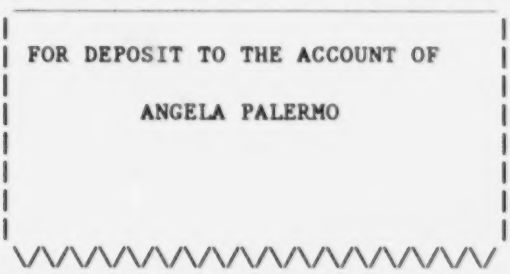
2. What might happen if this check is lost in the mail?

   SOMEONE ELSE COULD CASH THE CHECK

3. What type of endorsement should Angela have used?

   RESTRICTIVE

4. Endorse the back of the check below using that endorsement.



ACTIVITY A-5: WHAT ENDORSEMENT SHOULD YOU USE?
Problem Number 5
(TEACHER'S COPY)

You are making a part payment on Loan #876B which you have with the Fester Finance Company (FFC). You wish to pay the bill with a check which you received from Mr. Porter Norris by mail and insure that the payment applies to your loan.

1. What type of endorsement should you use for this check?

   FULL

2. Why do you think this endorsement is appropriate?

   FOR PROTECTION

3. Endorse the back of the check below using that endorsement.

PAY TO THE ORDER OF FESTER
FINANCE CO.
PAYMENT APPLIED TO LOAN #876B

YOUR SIGNATURE

UNIT B: COMPUTING TOTAL PAY

UNIT PLAN

Overview of Unit

1. The purpose of this unit is to present basic information pertaining to computing total wages and salaries for hourly, weekly, piece-rate and monthly workers. In addition, these topics are used as practical business settings for the review of multiplication and division by whole numbers and decimals.
2. This unit is fundamental to the course and should not be considered optional.
3. Each class period should contain rapid calculation drills (see Activity A-2) in multiplication and division to review and reinforce basic multiplication and division facts and skills. These drills should be designed and executed in the same manner as warmup and speed drills in keyboarding. That is, each class should begin with a 3- to 5-minute warmup drill on multiplication and division. Then one or more 3- to 5-minute speed drills on multiplication and division should be given within the class period to develop speed and accuracy. Persistent drill on multiplication and division under pressure of time will increase student speed and accuracy in multiplication and division just as these same techniques increase speed and accuracy in keyboarding.

Topical Outline of Unit

COMPUTING TOTAL PAY

1. Computing Total Pay for Hourly, Piece-Rate and Salaried Workers
   a. Computing total pay for workers paid by the hour
   b. Computing total pay for workers paid by the week or month
   c. Computing total pay for workers who receive tips or bonuses
   d. Computing total pay for workers paid on a piece-rate basis
      (1) computing total pay for straight piece-rate pay
      (2) computing total pay for graduated piece-rate pay

2. Reviewing Multiplication of Whole Numbers and Decimals
   a. Reviewing multiplication terms and concepts
   b. Placing the decimal point in the product
   c. Rounding the product
   d. Multiplying by 10, 100, 1,000 or other multiples of 10

e. Multiplying by numbers which end with zeros
f. Multiplying by decimal numbers
g. Multiplying by 0.10, 0.01 and 0.001
h. Verifying the multiplication process
i. Using a calculator to multiply whole numbers and decimals
j. Verifying the multiplication process on a calculator
k. Estimating the product

3. Reviewing Division of Whole Numbers and Decimals
   a. Reviewing division terms and concepts
   b. Placing the decimal point in the quotient
   c. Rounding the quotient
   d. Dividing by 10, 100, 1,000 or other multiples of 10
   e. Dividing to a stated number of decimal places
   f. Dividing by decimal numbers
   g. Dividing by 0.10, 0.01 and 0.001
   h. Verifying the division process
   i. Using a calculator to divide whole numbers and decimals
   j. Verifying the division process on a calculator
   k. Estimating the quotient

Unit Objectives

At the end of this unit, students should be able to

1. Multiply and divide whole numbers and decimals manually and with a calculator.
2. Compute total pay for hourly, piece-rate and salaried workers.
3. Place decimal points in products and quotients.
4. Round products and quotients.
5. Estimate products and quotients by rounding numbers and multiplying and dividing.
6. Prove products and quotients manually and with a calculator.

Teacher Resources for Unit

"Your Dollar is Getting Smaller." U.S. Chamber of Commerce, 1615 H Street, Washington, DC, 20006. A slide and tape presentation demonstrating the effect of inflation.

Elementary teachers of grades 3-6 may provide useful suggestions to business teachers in developing fundamental multiplication and subtraction skills.

Elementary arithmetic textbooks may provide the business teacher with many supplementary drill problems and exercises.

Local industries and firms will provide the business teacher with many examples of hourly wage rates, piece rates and salary rates for use in problems. Use of "real" or local wage and salary rates in problems usually increases student interest.

The Association of Information Systems Professionals provides an annual survey of salaries for a large list of clerical, secretarial, data processing and supervisory positions. National surveys such as this often can be a springboard for discussion of careers.

Review the Course Resources section, especially under the headings Textbooks and Materials for Secondary Students on the Fundamental Processes, Audio-Visual Materials and Computer Materials. These sections identify many materials useful for this unit.

Evaluation Ideas for Unit

A quiz may be given after each of these topics: computing total hourly, weekly and monthly pay and computing piece-rate pay. Separate timed examinations measuring speed and accuracy on drill materials in multiplication and division might be given after each of these fundamental processes has been covered. A unit examination including practical business problems computing total pay should be given. Unit grades earned by students might include scores on weekly rapid calculation drills, two quizzes, two timed examinations and the unit examination. Students can maintain skills and knowledge learned in the previous unit by doing selected drills on addition and subtraction and selected problems drawn from writing and keeping checkbooks and reconciling bank statements.

SUGGESTED STUDENT ACTIVITIES

Activity Name: Dividing Decimals B-1
Unit Objectives 1 and 3

Suggested Use of Activity

This is a very basic activity designed to introduce students to the correct method of dividing decimals. It involves moving the decimal to the right in the divisor to make it a whole number, moving the decimal in the dividend the same number of spaces to the right as moved in the divisor, and then dividing the divisor into the dividend to arrive at the correct quotient.

This activity must be mastered before students can continue to other units, such as determining the rate of pay being received.

Objectives of Activity

At the end of the activity, students should be able to

1. Calculate correctly the quotient by dividing two numbers containing decimals.
2. Realize the importance of being able to divide decimals correctly by being asked to answer questions about real-life situations.

Facilities or Materials Needed

Dividing Decimals handout
Transparency of Dividing Decimals
Pen/pencil and paper

Description of Activity

This activity consists of an activity form with directions, an example, and ten problems involving the division of decimals. The directions explain how to determine where to place the decimal point in the quotient and how to divide correctly the divisor into the dividend.

The first five problems shown on the activity form are basic problems involving dividing decimals. The next five questions are word problems. These word problems are designed to help students recognize the relevance of division of decimals in their daily lives.

Suggestions for Teacher

1. Do sample problems together as a class project using an overhead projector or chalkboard to help clarify any directions or problems for students.
2. Students should recognize the value of correctly dividing decimals and should see the relevance in such situations as determining rate of pay and price per ounce.

Suggestions for Evaluation

The activity form could be given as a quiz, or additional pages of the form could be developed to provide a test. The topics in this activity could be included as part of a unit test involving addition, subtraction, multiplication and division of decimals.

Name_____

ACTIVITY B-1: DIVIDING DECIMALS

DIRECTIONS: Before dividing a number with a decimal point in the divisor:

1. Move the decimal point to the right to make the divisor a whole number.
2. Count the number of spaces you had to move the decimal point in the divisor to the right.
3. Move the decimal point in the dividend the same number of spaces to the right. This will be where the decimal point will be in the answer.
4. Divide the numbers in the usual way.
5. Divide the following numbers, rounding off to the nearest hundredth or to the nearest cent.

EXAMPLE: 9.11 / 46.986647 = 911/4698.6647

1. 37 / 558.182

2. 4.3 / 29.477

3. 0.12 / .614

4. 92 / 981.05

5. 0.21 / 1.8745

Name_____

ACTIVITY B-1: DIVIDING DECIMALS
(Continued)

6. How many miles to the gallon would you get if you drove 520 miles and used 16.2 gallons of gasoline?

7. How much would you be earning an hour if you worked 15.5 hours and made $50.38?

8. What is the price per ounce of a 2.8 lb. chicken costing $2.21?

9. What would be the price per ounce of a can of green beans if you bought a 15.5 ounce can for $.47?

10. What would be the price per slice if you purchased an eight piece pizza for $6.78?

ACTIVITY B-1: DIVIDING DECIMALS
(TEACHER'S COPY)

DIRECTIONS: Before dividing a number with a decimal point in the divisor:

1. Move the decimal point to the right to make the divisor a whole number.
2. Count the number of spaces you had to move the decimal point in the divisor to the right.
3. Move the decimal point in the dividend the same number of spaces to the right. This will be where the decimal point will be in the answer.
4. Divide the numbers in the usual way.
5. Divide the following numbers, rounding off to the nearest hundredth or to the nearest cent.

EXAMPLE: $9.11 \overline{)46.986647} = 911\overline{)4698.6647}$ $\frac{5.1577}{}$ or 5.16

1. $37 \overline{)558.182}$ $\frac{15.09}{}$

2. $4.3 \overline{)29.477}$ $\frac{6.86}{}$

3. $0.12 \overline{).614}$ $\frac{5.12}{}$

4. $92 \overline{)981.05}$ $\frac{10.66}{}$

5. $0.21 \overline{)1.8745}$ $\frac{8.93}{}$

ACTIVITY B-1: DIVIDING DECIMALS
(TEACHER'S COPY)
(Continued)

6. How many miles to the gallon would you get if you drove 520 miles and used 16.2 gallons of gasoline?

Answer: 32.10

7. How much would you be earning an hour if you worked 15.5 hours and made $50.38?

Answer: $3.25

8. What is the price per ounce of a 2.8 lb. chicken costing $2.21?

Answer: $.06

9. What would be the price per ounce of a can of green beans if you bought a 15.5 ounce can for $.47?

Answer: $.03

10. What would be the price per slice if you purchased an eight piece pizza for $6.78?

Answer: $.85

Activity Name: Multiplying Decimals B-2
Unit Objectives 1 and 3

Suggested Use of Activity

This is a very basic activity designed to introduce students to the correct method of multiplying decimals. It involves multiplying two factors to arrive at the correct product and then determining where to place the decimal point.

The activity must be mastered before the students can continue to other units, such as completing time cards.

Objectives of Activity

At the end of the activity, students should be able to

1. Calculate correctly the product by multiplying two factors containing decimals.
2. Realize the importance of being able to multiply decimals correctly by being asked to answer questions about real-life situations.

Facilities or Materials Needed

Multiplying Decimals handout
Pen/pencil and paper
Transparency of Multiplying Decimals

Description of Activity

This activity consists of an activity form with directions, an example, and ten problems involving the multiplication of decimals. The directions explain how to multiply correctly two factors and how to determine where to place the decimal point in the product.

The first five problems shown on the activity handout are basic problems involving multiplying decimals. The next five questions are word problems. These word problems are designed to help students recognize the relevance of the multiplication of decimals in their daily lives.

Suggestions for Teacher

1. Do sample problems together as a class project using an overhead projector or chalkboard to help clarify any directions or problems for students.

2. Students should recognize the value of correctly multiplying decimals and should see the relevance of this skill in such topics as time cards.

Suggestions for Evaluation

The activity form could be given as a quiz, or additional pages of the form could be created to provide a test. The problems in this activity could be included as part of a unit test involving addition, subtraction, multiplication and division of decimals.

Name_____

ACTIVITY B-2: MULTIPLYING DECIMALS

DIRECTIONS:
1. When multiplying decimals, multiply as if the decimal numbers were whole numbers.
2. To find the number of decimal places in the product, count the total number of decimal places in the factors.
3. Beginning at the right of the product, count back the number of decimal places found in the factors and insert the decimal point.

EXAMPLE:
```
  4.21    <---  2 decimal places
x 0.4     <--- +1 decimal place

1.684     <---  3 decimal places
```

1.
```
  3.91
x .08
```

2.
```
  58.031
x .40
```

3.
```
   723.8
x 1.15
```

4.
```
   649
x .773
```

5.
```
   95.30
x 80.1
```

6. How many ounces of green beans would you have if you purchased 5 cans containing 15.50 ounces each?

7. How much money would you earn if you make $12.94 an hour and worked 35.7 hours?

Name _____

ACTIVITY B-2: MULTIPLYING DECIMALS
(Continued)

8. How much will you have to pay for 18.2 gallons of gasoline priced at $ .83 a gallon?

9. How much should you be paid if your rate of pay is $7.92 an hour and you worked one day from 8:00 am to 5:30 pm, with one hour off for lunch?

10. How much money will you owe if you purchase 7 books at $15.95 each?

ACTIVITY B-2: MULTIPLYING DECIMALS
(TEACHER'S COPY)

DIRECTIONS:
1. When multiplying decimals, multiply as if the decimal numbers were whole numbers.
2. To find the number of decimal places in the product, count the total number of decimal places in the factors.
3. Beginning at the right of the product, count back the number of decimal places found in the factors and insert the decimal point.

EXAMPLE:
```
  4.21    <---  2 decimal places
x 0.4     <--- +1 decimal place

 1.684    <---  3 decimal places
```

1.
```
  3.91
x .08

 .3128
```

2.
```
  58.031
x .40

 23.21240
```

3.
```
   723.8
x 1.15

 832.370
```

4.
```
   649
x .773

 501.677
```

5.
```
    95.30
x 80.1

 7633.530
```

6. How many ounces of green beans would you have if you purchased 5 cans containing 15.50 ounces each?

Answer: 77.5

7. How much money would you earn if you make $12.94 an hour and worked 35.7 hours?

Answer: $461.96

ACTIVITY B-2: MULTIPLYING DECIMALS
(TEACHER'S COPY)
(Continued)

8. How much will you have to pay for 18.2 gallons of gasoline priced at $ .83 a gallon?

Answer: $15.11

9. How much should you be paid if your rate of pay is $7.92 an hour and you worked one day from 8:00 am to 5:30 pm, with one hour off for lunch?

Answer: $67.32

10. How much money will you owe if you purchase 7 books at $15.95 each?

Answer: $111.65

Activity Name: Reading a Time Card B-3
Unit Objective 2

Suggested Use of Activity

This activity should precede any other activity designed to use time cards for determining pay, hours and rates. It is designed to help students achieve an understanding of the purpose and value of the time card.

The activity involves using simulated time cards. Students must read the time card and then answer specific questions. These questions ask for the identification numbers of employees, the hourly wages, the time an employee reported for work, and other relevant questions.

This basic activity can easily lead to new topics and activities, such as calculating hours worked and gross pay.

Objectives of Activity

At the end of the activity, students should be able to

1. Identify what information can be found on a time card and where it is located.
2. Draw conclusions comparing time cards (i.e. which employee worked the most hours).
3. Recognize the importance of a time card to both employer and employee.

Facilities or Materials Needed

Simulated Time Cards handout
Reading a Time Card handout
Pen/pencil and paper

Description of Activity

This activity consists of two parts. The first involves four simulated time cards and twenty-five questions relating to reading a time card. On the time cards are each employee's name, I.D. number, pay rate per hour and department of employment. Also included are the total hours worked per day, total hours worked per week, and gross pay. Five days of the week are listed (Monday through Friday) with a space for the starting time and a space for the quitting time. There is also a space for time spent at lunch. All calculations have been determined and the entire time card is filled in. Using the simulated time cards, students should answer the questions on Reading a Time Card handout.

The second part of the activity should involve a discussion in which the importance of the time card to both the employer and the employee is stressed. The following questions could be raised: What would happen if the card were improperly filled out? How can employees use the card if they feel that they were unfairly paid one week? How can employers use the card if they are considering firing an employee because of constant tardiness and excessive time taken during lunch hours?

Suggestions for Teacher

1. Discuss the parts of the time card together before the activity is assigned to help clarify any directions or problems for students. This can be accomplished by selecting a few questions from the sheet and answering them as a class project or by generally reviewing a time card using the overhead projector.
2. This activity can be used effectively to lead to new topics and activities. One such activity could be to have students determine the total hours worked and gross pay.

Suggestions for Evaluation

Additional activity forms may be created to provide a test. Questions taken from the second part of the activity could be used as a short-answer or essay test to test student understanding of the time card and its importance.

Name _____

ACTIVITY B-3: SIMULATED TIME CARDS

NAME Pete N. Repeat

I.D. No. 487 RATE: $3.50

DEPT. Custodial

Day	Time In	Time Out	Lunch	Total Hours
Mon.	8:00	4:00	1/2 hr.	7.5
Tue.	8:00	4:30	1 hr.	7.5
Wed.	8:00	4:30	1/2 hr.	8
Thr.	8:00	4:00	1 hr.	7
Fri.	9:00	12:00	0 hr.	3

Total hours for week 33

Gross pay $115.50

NAME Billie Klub

I.D. No. 488 RATE: $3.75

DEPT. Secretarial

Day	Time In	Time Out	Lunch	Total Hours
Mon.	9:00	5:00	1/2 hr.	7.5
Tue.	9:00	5:30	1/2 hr.	8
Wed.	9:00	5:00	1/2 hr.	7.5
Thr.	9:30	5:30	1/2 hr.	7.5
Fri.	9:00	5:30	1/2 hr.	8

Total hours for week 38.5

Gross pay $144.38

Name_____

ACTIVITY B-3: SIMULATED TIME CARDS
(Continued)

NAME R. U. Dunn

I.D. No. 489 RATE: $5.57

DEPT. Research

Day	Time In	Time Out	Lunch	Total Hours
Mon.	8:00	5:00	1 hr.	8
Tue.	8:00	4:30	1/2 hr.	8
Wed.	8:00	5:00	1/2 hr.	8.5
Thr.	7:30	4:00	1/2 hr.	8
Fri.	8:00	2:00	1/2 hr.	5.5

Total hours for week 38

Gross pay $211.66

NAME I. M. Phinish

I.D. No. 490 RATE: $6.43

DEPT. Sales

Day	Time In	Time Out	Lunch	Total Hours
Mon.	9:00	12:00	0 hr.	3
Tue.	8:00	5:00	1 hr.	8
Wed.	8:00	5:00	1 hr.	8
Thr.	8:00	5:00	1 hr.	8
Fri.	9:00	4:00	1 hr.	6

Total hours for week 33

Gross pay $212.19

Name _____

ACTIVITY b-3: READING A TIME CARD

DIRECTIONS: Using the time cards provided, answer the following questions.

1. What is the identification number (I.D. No.) of Pete N. Repeat?

   _____

2. For which department of the company does Pete work? _____

3. How many hours did Pete work this week? _____

4. Who is the employee that has the I.D. No. 489? _____

5. How much does he get paid per hour? _____

6. In what department does employee number 488 work? _____

7. How many hours did employee number 488 work on Tuesday? _____

8. What is the gross pay of employee number 488? _____

9. What is the total hours for the week that I. M. Phinish worked?

   _____

10. What did I. M. Phinish earn for this week? _____

11. Why didn't Pete write down his time for lunch on Friday?

    _____

12. Which employee had the most consistent lunch period?

    _____

13. What time did employee number 490 start work on Monday? _____

14. Who spent the least time at lunch for the week? _____

Name _____

ACTIVITY B-3: READING A TIME CARD
(Continued)

15. Who put in the longest day of work, not counting lunch?

_____

16. Which employee worked the most hours this week? _____

17. Which employee worked the least number of hours this week?

_____

18. Who earns the most pay per hour? _____

19. Who earned the most pay this week? _____

20. Which employee spent the most time at lunch for the week?

_____

21. How many hours did the employee in question #20 spend at lunch for the whole week?

_____

22. What time did employee number 487 start work on Friday?_____

23. What time did Billie Klub start work on Thursday? _____

24. What is the identification number for the secretary? _____

25. What was the total pay for everyone this week? _____

ACTIVITY B-3: READING A TIME CARD
(TEACHER'S COPY)

DIRECTIONS: Using the time cards provided, answer the following questions.

1. What is the identification number (I.D. No.) of Pete N. Repeat?

   487

2. For which department of the company does Pete work? CUSTODIAL

3. How many hours did Pete work this week? 33

4. Who is the employee that has the I.D. No. 489? R. U. DUNN

5. How much does he get paid per hour? $5.57

6. In what department does employee number 488 work? SECRETARIAL

7. How many hours did employee number 488 work on Tuesday? 8

8. What is the gross pay of employee number 488? $144.38

9. What is the total hours for the week that I. M. Phinish worked?

   33

10. What did I. M. Phinish earn for this week? $212.19

11. Why didn't Pete write down his time for lunch on Friday?

    HE DIDN'T EAT LUNCH DURING HOURS WORKED

12. Which employee had the most consistent lunch period?

    BILLIE KLUB

13. What time did employee number 490 start work on Monday? 9:00

14. Who spent the least time at lunch for the week? BILLIE KLUB

ACTIVITY B-3: READING A TIME CARD
(TEACHER'S COPY)
(Continued)

15. Who worked the longest total hours for the week?

R. U. DUNN

16. Which employee worked the most hours this week? BILLIE KLUB

17. Which employee worked the least number of hours this week?

PETE N. REPEAT and I. M. PHINISH

18. Who earns the most pay per hour? I. M. PHINISH

19. Who earned the most pay this week? I. M. PHINISH

20. Which employee spent the most time at lunch for the week?

I. M. PHINISH

21. How many hours did the employee in question #20 spend at lunch for the whole week?

4 HOURS

22. What time did employee number 487 start work on Friday? 9:00

23. What time did Billie Klub start work on Thursday? 9:30

24. What is the identification number for the secretary? 488

25. What was the total pay for everyone this week? $683.73

Activity Name: Estimating Solutions B-4
Unit Objective 5

Suggested Use of Activity

This activity is designed to demonstrate to students that whenever they are determining a solution using addition, subtraction, multiplication or division, the answer may be quickly checked using estimation.

The estimation method should be used to check any answers given in the class throughout the year and can also be used effectively outside the classroom.

The estimation method described in this activity will be included in future units.

Objectives of Activity

At the end of the activity, students should be able to

1. Correctly estimate the answer to addition, subtraction, multiplication or division problems.
2. Recognize the worth of the estimation method in practical situations outside the classroom.

Facilities or Materials Needed

The Estimation Method handout
Pen/pencil and paper

Description of Activity

This activity consists of a worksheet form containing several problems involving addition, subtraction, multiplication and division. Students should be instructed to complete the problems using the long method and then check their answers using the estimation method.

Suggestions for Teacher

1. Provide a clock which allows students to measure the time it takes to check a problem using the long method compared to the time it takes to check a problem using the estimation method.
2. Do several problems on the board or overhead with the class to clarify any directions or problems for the student.

Suggestions for Evaluation

A worksheet similar to the one included in this activity could be created to provide a test.

Name_____

ACTIVITY B-4: THE ESTIMATION METHOD

DIRECTIONS: When checking the answers to a problem using addition, subtraction, multiplication or division, it is quicker to use the estimation method. To use this method, round each number to the last digit on the left before performing the calculation.

First do each problem in the regular way. Then round each number in the problem to the last digit on the left and place it in the blank provided. Perform the calculation using the rounded numbers.

EXAMPLE:

15	20
+ 12	+ 10
27	30

1.

23	____
+ 17	+ ____
____	_____

2.

367	____
+ 918	+ ____
_____	_____

3.

515.02	_____
x 982.19	x _____
_____	_____

4.

4.27	_____
8.93	_____
+ 3.71	+ _____
_____	_____

Name_____

ACTIVITY B-4: THE ESTIMATION METHOD (Continued)

5. 1,987 _____

- 392 - _____

_____ _____

6. 4,032 _____

x 778 x _____

_____ _____

7. 7,029 _____

79 _____

9,742 _____

+ 351 + _____

_____ _____

8. 29 _____

- 18 - _____

_____ _____

9. 87 / 9324 / _____

10. 103 / 4477 / _____